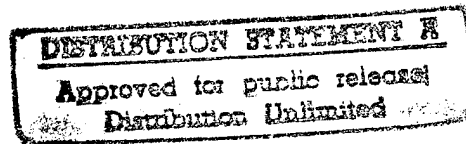


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**U.S. Army
Environmental
Center**

MANUAL FOR THE PREPARATION OF INSTALLATION ENDANGERED SPECIES MANAGEMENT PLANS



March 13, 1995

Unlimited Distribution
Approved for Public Release

Prepared by

**SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831**

Prepared for

**U.S. ARMY ENVIRONMENTAL CENTER
Attn: SFIM-AEC-ECN
Aberdeen Proving Ground, Maryland 21010-5401**

Submitted to

**U.S. ARMY ENGINEER DISTRICT, MOBILE
P.O. Box 2288
Mobile, Alabama 36628-0001**

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DEPARTMENT OF THE ARMY
ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT
600 ARMY PENTAGON
WASHINGTON DC 20310-0600



REPLY TO
ATTENTION OF

DAIM-ED-N (420-74c)

9 MAR 1995

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Manual for the Preparation of Endangered Species
Management Plans

1. Reference memorandum, HQDA, DAIM-ED-N, 15 Feb 94, subject: Endangered/Threatened Species Guidance {Chapter 11, AR 420-74 (soon to be issued under AR 200-3)}.
2. Chapter 11 requires Army installations containing Federally listed species to prepare Endangered Species Management Plans (ESMP) to ensure full compliance with the Endangered Species Act. To aid installations in meeting this requirement, the enclosed document entitled Preparation of Installation Endangered Species Management Plans, is provided for your consideration.
3. This effort was conducted under the leadership of the Army Environmental Center with support from the Corps of Engineers, Mobile District, MACOMs, installations, and Environmental Programs Directorate, Conservation Division; and included coordination with the U.S. Fish and Wildlife Service, Office of Endangered Species, Washington, DC. Care has been taken to ensure that information included in this document is consistent with Army policy. Therefore, we fully endorse this document and encourage installations to give it full consideration when preparing ESMPs.
4. POCs for this effort are Mr. Phil Pierce, DAIM-ED-N, (703) 696-8813 and Mr. Scott Belfit, SFIC-AEC-ECN, (410) 671-1590.

FOR THE ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT:

Encl

for *R.F. Finch* P.E. LTC(P) GS
FRANK R. FINCH, P.E. DEPUTY
Colonel, GS DIRECTOR
Director, Environmental Programs

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1382

DIRECTOR, U.S. ARMY CENTER FOR PUBLIC WORKS, ATTN: CECPW-F,
HUMPHREYS ENGINEER CENTER, 7701 TELEGRAPH ROAD, ALEXANDRIA, VA
22310-3862

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Prepared by

Science Applications International Corporation
P.O. Box 2502
800 Oak Ridge Turnpike
Oak Ridge, Tennessee 37831

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Submitted to

U.S. Army Engineer District, Mobile
P.O. Box 2288
Mobile, Alabama 36628-0001

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ACRONYMS AND ABBREVIATIONS

| | |
|-----------|--|
| AR | Army Regulation |
| ARMY | U.S. Army |
| DA | Department of the Army |
| DAIM-ED-N | Director of Environmental Programs |
| ECAP | Environmental Compliance Achievement Program |
| ESA | Endangered Species Act of 1973 |
| ESMG | Endangered Species Management Guidelines |
| ESMP | Endangered Species Management Plan (includes listed and proposed threatened species) |
| EQCC | Environmental Quality Control Committee |
| FE | Facility Engineer |
| FWS | U.S. Fish and Wildlife Service |
| HQDA | Headquarters, Department of the Army |
| MACOM | Major Army Command |
| MCA | Military Construction Army |
| NEPA | National Environmental Policy Act |
| NMFS | National Marine Fisheries Service |
| O&M | Operations & Maintenance |
| SJA | Staff Judge Advocate |
| T&E | threatened and endangered |
| TRADOC | U.S. Army Training and Doctrine Command |

1.0 INTRODUCTION

1.1 Intent

Department of the Army (DA) personnel at all levels must ensure that they carry out mission requirements in harmony with the requirements of the Endangered Species Act (ESA) of 1973, Sections 1531 to 1544, Title 16, United States Code (16 USC 1531-1544). Mission requirements do not justify actions violating the ESA. All U.S. Army (Army) land uses, including military training, testing, timber harvesting, recreation, and grazing are subject to ESA requirements for the protection of listed species and critical habitat. The key to successfully balancing mission requirements and the conservation of listed species is long-term planning and effective management to prevent conflicts between these competing interests.

The objective of this manual is to provide a format for developing management plans for listed and proposed threatened and endangered (T&E) species on Army installations, consistent with Species Recovery Plans published by the U.S. Fish and Wildlife Service (FWS). It is intended to meet the requirements of the ESA and procedural requirements of the Army's policy and guidance on T&E species matters on Army installations. It will also provide uniform and standardized information necessary to manage listed and proposed T&E species to ensure that Army actions will not jeopardize the continued existence of such species or result in the destruction or adverse modification of their critical habitat.

This manual is not meant to be used in the place of regulations on matters pertaining to T&E species. Specifically, Chapter 11 of AR 200-3 should be consulted during the preparation of management plans and other documents pertaining to T&E species.

1.2 Legal Requirements

Passage of the Endangered Species Act of 1973 (Public Law 93-205) (ESA 1973) gave the United States one of the most far-reaching laws ever enacted by any country to prevent the extinction of animals and plants. Under the law, the Secretary of the Interior, acting through the FWS, has broad powers to protect and conserve terrestrial and nonmarine wildlife and plants (excluding anadromous fish) that the Secretary finds in serious jeopardy of extinction. The Secretary of Commerce, acting through the National Marine Fisheries Service (NMFS), has similar authority for protecting and conserving marine life and anadromous fish. Congress addressed the question of why we should save endangered species in the beginning of the ESA, holding that endangered and threatened species of fish, wildlife, and plants are of aesthetic, ecological, educational, historical, recreational, and scientific value to the nation and its people (FWS 1992).

ESA, §7
(a)(1)(2)

The ESA states that "all ... Federal agencies shall, in consultation with and with the assistance of the Secretary (of the Interior or Commerce), utilize their authorities in furtherance of the purposes of ... (the ESA) by carrying out programs for the conservation of endangered species and threatened species... Each Federal agency shall, in consultation with and with the assistance of the Secretary (of the Interior or Commerce), insure that any action authorized, funded, or carried out by such agency ... is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary (of the Interior or Commerce), after consultation as appropriate with affected States, to be critical, unless such agency has been granted an exemption for such action.... In fulfilling the requirements of this paragraph, each agency shall use the best scientific and commercial data available.

DA personnel who violate the provisions of the ESA or implementing FWS/NMFS regulations are subject to both civil and criminal penalties. DA personnel are not immune from prosecution. Installations will enforce the protective measures specified in Endangered Species Management Plans (ESMPs) by the issuance of regulations punishable under the Uniform Code of Military Justice. Installations are required to designate and train law enforcement personnel to enforce these regulations.

AR 200-3,
11-3a

AR 200-3,
11-3c

1.3 Scope

Installations are required to prepare ESMPs for listed and proposed T&E species and critical habitat present on the installation, including areas used by tenant organizations. The suggested procedures reflected in this manual are applicable to the management of listed and proposed T&E species within the context of normal activities associated with the mission of an installation. It addresses the management of listed and proposed T&E species in concert with the mission and other land-use objectives on the installation. All Army land uses, which include such activities as military training, testing, timber harvesting, recreation, and grazing, are subject to ESA requirements for the protection of listed species and critical habitats. An ESMP should be used as a tool for accomplishing the goal of maintaining and enhancing populations of listed and proposed T&E species.

AR 200-3,
11-5a

AR 200-3,
11-1a

A thorough inventory of plants, fish, wildlife, and habitat types on installation lands is a prerequisite to the full execution of an ESMP. Installations are required to conduct a 100 percent inventory of suitable habitat using scientifically accepted methodology for listed, proposed, and category 1 candidate species that may occur on the installation. Failure to properly inventory listed and proposed species can lead to violation of the ESA and costly disruption of military operations and construction activities upon discovery of such species.

AR 200-3,
11-11

Although not required, installations are encouraged to develop ESMPs for candidate species. These species are under consideration for potential listing and should be considered in decisions that may affect them. At a minimum, installations will document the distribution of candidate species on the installation and monitor their potential listing status. Early planning and coordination with the FWS or NMFS will avoid unnecessary conflicts with mission requirements and speed development of an ESMP if the species is formally proposed for listing.

AR 200-3,
11-4a

Installations must be sensitive to those species listed as T&E under state law and should coordinate with state authorities in efforts to conserve these species. State species are not protected under the ESA, however, many of these species are protected under other laws such as the Migratory Bird Treaty Act. There is no requirement for ESMPs for state-listed species; however, installations will identify state-listed species in the installation's cooperative plan, as required by the Sikes Act (16 USC § 670a), and set forth agreed upon conservation measures with state authorities.

AR 200-3,
11-4b

AR 200-3,
11-4b

Major construction and other activities having similar impacts on the environment require a biological assessment under the ESA. This assessment must be coordinated with the appropriate FWS or NMFS field office and the ESMP will be updated as appropriate. It is important to note that biological assessments do not replace environmental documentation required under the National Environmental Policy Act (NEPA). Also, NEPA documentation does not replace biological assessments. They are separate requirements (see Section 2.3).

AR 200-3,
11-2d

Major Army Command (MACOM) or Headquarters, Department of the Army (HQDA) Endangered Species Management Guidelines (ESMGs) may exist for listed (e.g., Red-cockaded woodpecker) or proposed T&E species. MACOM or HQDA ESGMs will contain guidance to be used by installations in preparing installation ESMPs. Before beginning an ESMP, installations should request any ESGM that may be available from MACOM or HQDA.

1.4 Key Steps in Developing ESMPs

Preparation of installation ESMPs requires a systematic, step-by-step approach. T&E species populations (current and goal), T&E habitat (current and potential), and training and other mission requirements (present and future) must be identified. Detailed analysis of these factors and their interrelated impacts are required as a first step in the development of an ESMP. These steps will form the basis by which the development and execution of an ESMP will be evaluated.

Developing the key steps in the ESMP process will also help establish the conservation goals for the T&E species. "Conservation," as defined by the ESA, means the use of all methods and procedures that are necessary to bring any listed species to the point where protections

ESA, § 3(3)

provided pursuant to the ESA are no longer necessary. The Army, in identifying conservation goals for listed and proposed T&E species, has a responsibility to take affirmative measures to avoid jeopardizing the continued existence of species, while simultaneously seeking to meet its mission requirements. The goals for a listed and proposed T&E species must, therefore, be set at a level to assure maintenance of populations and to increase numbers of individuals, where practicable, through habitat enhancement.

To ensure T&E species conservation goals and military mission requirements are properly addressed, installations are encouraged to use the following or a similar methodology in developing an ESMP:

1. Determine the current T&E species population and distribution on the installation.
2. Identify any areas on the installation that are suitable or potentially suitable habitat for the T&E species involved.
3. Establish the installation T&E population goal with the FWS. The installation T&E population goal will at least equal the current population.
4. Identify installation and tenant unit mission requirements. Overlay these requirements on the T&E distribution scheme.
5. Identify mission requirements that are incompatible with the conservation of T&E habitat.
6. Identify areas where conflicting mission requirements could be relocated to avoid T&E habitat.
7. Identify critical mission areas where activities cannot be relocated.
8. In consultation with the FWS, investigate opportunities, as appropriate, to conduct training and/or testing activities within installation T&E species habitat to determine the type and level of these activities that are compatible with the conservation of protected species and their critical habitat. This will require the development of a well designed monitoring plan to evaluate the effects of training and testing activities on T&E species and their critical habitat, including provisions to cease such activities should analysis indicate unacceptable levels of impact have or are likely to occur.
9. In consultation with the FWS, assess the potential for the recruitment and/or translocation of T&E species within suitable habitat.
10. If applicable, identify areas suitable for T&E habitat improvements and free of conflicting present and projected

mission activities. These are prime sites for designation as recruitment and translocation areas.

11. Analyze the information developed above using the guidance contained in Steps 1-10 above.
12. Prepare the ESMP to implement the best combination of options, consistent with meeting the established T&E population goal, while minimizing adverse impacts to training readiness and other mission requirements.

1.5 Use of this Manual

This manual is designed to assist personnel in developing an ESMP, consistent with Army policy set forth in AR 200-3, Chapter 11. Each listed or proposed T&E species and critical habitat known to be present on an installation is required to have an ESMP prepared for it. The following outline presents the information that should be included in an ESMP in a format that facilitates review by higher headquarters.

AR 200-3,
11-5b(1)

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Each section of an ESMP is discussed in this document. Information is provided on the content of each section, where to obtain the information, and references to Army regulations or guidance. In Appendix A, an example plan using a real species on a hypothetical installation has been presented to illustrate how a plan may look once it is prepared.

If more than one listed and proposed T&E species occurs on an installation, combined ESMPs may be prepared that cover all listed and proposed T&E species, provided that the combined plan covers all the information discussed in Chapter 11 of AR 200-3. Combined ESMPs

AR 200-3,
11-5b(1)

AR 200-3,

that address several species and focus on the management of supporting ecosystems are encouraged. It is an Army goal to systematically conserve the biological diversity of natural ecosystems on Army lands within the context of its mission.

11-1c(1)

DoD Memo
8 Aug 94

There is no recommended length for a single-species ESMP. Length and detail of installation ESMPs are dependent upon the complexities of management problems associated with the mission, the species, and their habitats. Although lengthy tables and figures should be avoided, they may, when necessary, be incorporated into appendices.

2.0 COORDINATION

2.1 Preparation of ESMPs

The installation engineer or environmental director, as applicable, in coordination with the testing or training directorate and the installation environmental law specialist, is responsible for preparing installation ESMPs. A working team composed of, at a minimum, natural resources personnel, testers or trainers, and the environmental law specialist should draft an ESMP. Assistance can be provided by contractors or others in cooperation with other agencies. All work, however, should be accomplished under the supervision of the installation commander. The installation engineer or environmental director will identify and arrange for other installation personnel to advise the team on funding and contracting matters. The team is responsible for complying with NEPA and ESA procedural requirements, including conference and consultations with the FWS or NMFS, coordination with appropriate state agencies (State concurrence to the Cooperative Plan is necessary under the Sikes Act), and preparation of NEPA documentation. The team will informally consult with and receive input from the FWS or NMFS throughout the ESMP development process. On smaller installations and government-owned, contractor-operated facilities, where there are inadequate resources to establish a team [e.g., no offices of The Staff Judge Advocate (SJA) or natural resources personnel], the responsible installation engineer or environmental director will coordinate with the MACOM staff for the necessary support. Coordinating with the FWS or the NMFS and state agencies during the early planning and preparation of the ESMP is essential for the development of a successful plan.

AR 200-3,
11-6a(1)

2.2 Coordination with Other Installation Plans/Activities

Upon approval of the ESMP by the installation commander, the installation engineer or environmental director will obtain final, formal agreement from the FWS or NMFS, and the state wildlife agency, to include the ESMP as part of the cooperative plan (informal agreement should be obtained during the development process). Installations will revise the installation Real Property Master Plan according to Chapter 3, AR 210-20. The ESMP must also be integrated into the 10-year Range

AR 200-3,
11-6a(5)

Development Plan (AR 210-21) and the Integrated Natural Resource Management Plan. Installations will forward a copy of the approved ESMP to HQDA, Director of Environmental Programs (DAIM-ED-N), and the MACOM engineer or MACOM environmental director, as appropriate. Installations should be aware that other installation plans and activities may have to be modified in order to accomplish the goals of the ESMP. It is important to note that if the requirements of the ESMP are not integrated into other plans and activities, violations of the ESA are more likely to occur.

The MACOM engineer or MACOM environmental director will review installation ESMPs to monitor compliance with Chapter 11 of AR 200-3, to identify funding and personnel requirements, and to identify problems that could significantly impact future mission requirements. Every effort will be made by the MACOMs to resolve identified problems and issues. The MACOM will report problems that cannot be resolved to DAIM-ED-N. The MACOMs and HQDA will retain copies of ESMPs and will make them available to other installations that could benefit from the completed work.

AR 200-3,
11-6a(6)

2.3 NEPA Compliance

NEPA, implemented by AR 200-2, applies to actions taken in managing listed and proposed T&E species and their critical habitats. Consultation under Section 7 of the ESA does not replace compliance with NEPA requirements. In preparing and staffing ESMPs, proponents must ensure that they satisfy NEPA requirements. Proponents will normally prepare environmental assessments for activities, including developing ESMPs, that affect Federal or state, listed or proposed species, or critical or proposed critical habitat. NEPA requires preparation of an environmental impact statement when it is determined that a proposed action has the potential to significantly affect a listed or proposed T&E species or critical habitat. To avoid unnecessary delay in the planning or implementation of an ESMP, proponents should provide complete NEPA documentation along with recommendations or reports on ESMPs.

AR 200-3,
11-6f

AR 200-2,
6-2f

Consultation, conference, and biological assessment procedures under Section 7 of the ESA should be consolidated with NEPA procedures to the maximum extent feasible. Simultaneous compliance with NEPA and ESA procedures minimizes duplication of effort and avoids delay. Proponents may combine ESA and NEPA documentation to reduce paperwork (such as the biological assessment and environmental assessment) so long as the requirements of both statutes are met. Generally, an installation should determine the effect of a proposed action on listed species or critical habitat in accordance with ESA Section 7 before completing NEPA documentation. Proponents will not avoid consultation with the FWS or NMFS to facilitate completion of NEPA documentation.

AR 200-3,
11-6f(2)

2.4 Plan Review/Approval

The installation office of SJA will render a written legal opinion stating whether the approval of the ESMP and supporting NEPA documentation is in accordance with NEPA, ESA, and regulatory requirements before the ESMP is forwarded to the installation commander for approval.

AR 200-3,
11-6a(3)

The installation engineer or environmental director will brief the Environmental Quality Control Committee (EQCC) on each proposed ESMP and supporting documentation.

AR 200-3,
11-6a(2)

An ESMP is not effective until it and the supporting NEPA documentation are approved and signed by the installation commander. Installations will then forward a copy of the approved ESMP to HQDA, ATTN: DAIM-ED-N and the MACOM engineer or staff environmental director, as appropriate.

AR 200-1,
2-5

AR 200-3,
11-6a(4-5)

2.5 Monitoring Compliance with and Effectiveness of ESMPs

The following means will be used to monitor installation compliance with and the effectiveness of installation ESMPs. Those conducting assessments, will, at a minimum, use the checklist contained in each ESMP.

AR 200-3,
11-6g

- (1) Assessments: Installations will ensure that external and internal environmental audits, conducted according to AR 200-1,12-8, thoroughly assess compliance with, progress under way, and the effectiveness of ESMPs. Prior to commencing assessments, the installation engineer or environmental director will provide assessment teams with ESMP checklists and explain their use and purpose.

AR 200-1,
12-8

AR 200-3,
11-6g(1)

- (2) ESMP Compliance Report: During the fourth quarter of each calendar year, the installation engineer or environmental director will make a written report to the installation commander. The report will be reviewed by the installation SJA and the EQCC before it is sent to the installation commander.

AR 200-3,
11-6g(2)(a)

The ESMP Compliance Report shall include the following information: the status of listed and proposed T&E species and their habitats on the installation, progress toward installation conservation goals, actions taken to implement ESMPs, contacts with the FWS or NMFS, ESA violations, problem areas, compliance with MACOM and HQDA guidance, changes to ESMPs, and any other information necessary for reviewers to make an independent assessment of installation compliance with and the effectiveness of ESMPs in balancing conservation with other mission requirements. If the report concludes that the installation is not in full compliance with the ESMP or that the ESMP is not effective in meeting installation goals, it shall

AR 200-3,
11-6g(2)(b)

contain an enumeration of the deficiencies and recommendations for resolving them.

Installation commanders will approve and sign annual ESMP reports. Installations will forward approved reports to the MACOM for review and approval. Reports must be received by the MACOM by 31 December.

AR 200-3,
11-6g(2)(c)

If an installation is not in full compliance with an ESMP, the ESMP is not effective in meeting the installation's goals. If another listed or proposed T&E species management problem is indicated, the MACOM will coordinate with DAIM-ED-N and other organizations, as necessary, to develop an effective solution.

AR 200-3,
11-6g(2)(d)

- (3) Major ESMP Revision: Major revisions to all parts (including the ESMP) of the Installation Natural Resources Management Plan will be accomplished at least every 5 years.

AR 200-3,
9-4

2.6 Annual Review of ESMPs

Proponents will review their ESMPs annually and update them as required to meet conservation goals. These reviews should be conducted concurrently with the preparation of the annual installation engineer's or environmental director's ESMP compliance report (discussed in Section 2.5). Except for minor changes, installations will prepare and approve revisions in the same manner as the ESMPs themselves. Minor changes may be approved by the installation engineer or environmental director, after coordination with the SJA and training or testing directorate, informal consultation with the FWS or NMFS, and coordination with the appropriate state agency. Minor changes include only those changes that will have no effect (considered together with all previous minor changes to the current ESMP), beneficial or adverse, on listed or proposed species or critical habitat. The cooperative plan will be amended to reflect minor changes at least every 2 years.

AR 200-3,
11-6e

3.0 PLAN FORMAT

(NOTE: All references to regulations or guidelines used in the development and preparation of the ESMP need to be specifically cited by section and item number at that place in the document where the information is used.)

3.1 Title Page

The title page of the ESMP should include the following information: title of the plan (including common and scientific name of the listed and proposed T&E species), name of installation, name and affiliation of person preparing the ESMP, and effective dates of the plan. If the ESMP was prepared under contract, the name of the installation

Endangered Species Management Plan
for
(Common name of species, *Scientific name of species*)

(Name of installation)

prepared by
(author's name)
(author's title)
(author's organization/affiliation)

Effective Dates: (date -- date)

Figure 1. Format for ESMP Title Page.

office with technical oversight of the contract should appear between the name and affiliation of the person preparing the ESMP and the effective dates of the plan. The indicated format for the title page is shown in Figure 1.

3.2 Approval Page

The page following the title page acknowledges the approval of the ESMP by the Installation Commander. It also acknowledges the review of the ESMP by the Chief, Environmental Directorate (or Installation Engineer on small installations), and the SJA.

3.3 Table of Contents

The table of contents with referenced page numbers follows the approval page.

3.4 Tables

This page lists all tables in the ESMP with referenced page numbers.

3.5 Figures

This page lists all figures in the ESMP with referenced page numbers.

3.6 Acronyms/Abbreviations

This page lists all acronyms and abbreviations used in the ESMP.

3.7 Executive Summary

The Executive Summary should be a clear, concise, and brief presentation of the important elements contained in the ESMP. It should not exceed two single-spaced pages and should focus on DA Policy, ESA, coordination with agencies, compliance (e.g., NEPA), and costs to accomplish the mission. The Executive Summary should also identify the potential impact of implementing or not implementing the ESMP. The suggested format for the Executive Summary is shown in Figure 2.

3.8 Introduction

This section of the ESMP identifies the purpose of the plan and serves to acquaint the reader with the species, its status, and the threats it faces. The introduction should present relevant information concerning the species, threats to its survival, reasons for listing, and the need for

EXECUTIVE SUMMARY

Background: Army policy regarding T&E species should be briefly summarized here, including the need for coordination with other agencies and compliance with NEPA. The consequences of not implementing the ESMP should be stated.

Current Species Status: Listing status of the species, sizes and distribution of populations on the installation, distribution and abundance nationwide, and vulnerability to threats on the installation should be included in this section.

Habitat Requirements and Limiting Factors: List any specialized habitat requirements and major threats to be addressed under Actions Needed.

Management Objectives: Protection and/or enhancement (if possible) of existing populations for the foreseeable future, or until the species is delisted.

Conservation Goals: Indicate the number, size, and arrangement of viable populations, and any mission requirements which have been or will need to be resolved. Be specific with conservation goals, in terms of numbers of populations and their distribution, population sizes, and amount of currently occupied and potential habitat (area) on the installation. These measurable criteria allow the installation to assess progress toward the Management Objectives.

Actions Needed: Present a numbered list of the major steps needed to satisfy Management Objectives. These might include: conducting additional field surveys, monitoring existing populations to detect increase or decline, conducting research on biology of the species, or eliminating threats to the species that are within the installation's control.

Total Estimated Cost of Conservation Actions: A cost table or a cost summary should be provided to demonstrate the financial resources needed over a specific time period to carry out each of the Actions Needed.

Figure 2. Format for ESMP Executive Summary.

management. No topic should be covered in depth, because more detailed information will be presented in Section 3.9. A description of the information presented in the plan and how it is to be used by the installation should be included.

3.9 Species Information

This section should be arranged to facilitate quick and easy access to the information it contains. A suggested format for the section follows, and it is recommended that subsections be identified in the Table of Contents. Species information that is general (i.e., not site-specific) is available from the FWS or NMFS. The information presented in this section should (1) reflect information prepared by the installation in compliance with consultation requirements of Section 7 of the ESA and (2) align with the installation's biological assessment of the species and, in many cases, with the biological opinion(s) issued by the FWS/NMFS.

AR 200-3,
11-2c(1)
AR 200-3,
11-2d

Description - Give the date the T&E species was listed or proposed and the *Federal Register* citation for the rule. Provide a nontechnical summary description of the species, with detail on the level of popular field guides, and give information on species that are similar in appearance and note how to differentiate. Refer to the best available technical descriptions, with appropriate citations for further information.

Distribution - Give historical and currently occupied geographic range. Include maps of appropriate scale to delineate population locations nationwide, regionally, and on the installation. Documented survey and inventory information for the species on the installation, including spatially referenced graphics, shall be presented. Maps showing nearby populations that are not within the installation boundary should be included because these may be functioning as metapopulations and may be important in species management on the installation. This subsection is one that will likely require periodic updating.

AR 200-3,
11-5b(4)(a)

Habitat/Ecosystem - This may be a separate subheading or, if little information is available, may be combined with the following subsection. Include relevant information, such as soil type (particularly for plants), plant or community associations, elevation, requirements for water quality, flow regimes, etc. Describe critical elements of the ecosystem inhabited by the species that should be considered by persons proposing activities that may affect the species. Such elements may include sensitive life stages, symbiotic relationships, cover, food, the effects of actions favoring competitors, predators, etc. The information in this section will be useful in consultations with the FWS or NMFS under Section 7 of the ESA.

Life History/Ecology - Include what is known for plants about time of bud break, flowering, and fruiting; pollinators and their typical travel distance; dispersal; etc. Include what is known for animals about

breeding habits, litter or clutch size, diet, behavior, etc. Describe the tolerance of the species or local populations to loss of individuals, if it is known. As in all previous sections, try to focus on brevity without sacrificing thoroughness, and be sure to cite literature used in preparing this section.

Reasons for Listing - This will include an overview of the species decline (if known) and the threats it faces. A description of the land management practices that are affecting the species should be included. (The "Factors Affecting the Species" section of the listing rule for the species, published in the *Federal Register*, is a good starting point for this subsection.)

Conservation Measures - List any ongoing conservation efforts for the species, either by the installation, the state, nongovernmental organizations, the FWS, or NMFS. This subsection will likely require updating in future revisions.

3.10 Conservation Goals

AR 200-3,
11-5b(3)

This section should state objective, measurable criteria that, when met, would meet the installation's conservation goals for the listed and proposed T&E species or critical habitat. These should be established in consultation with the FWS or NMFS and consistent with the species recovery plan goals and objectives. As a general rule, higher Army headquarters guidelines, if they exist, will not state specific numerical goals for numbers of individuals or quality of habitat that installations should seek to achieve for specific listed and proposed T&E species.

AR 200-3,
11-5b(4)(b)

Goals should be carefully calculated considering the current and future installation and tenant unit missions, the amount and distribution of current and future installation and tenant unit missions, the amount and distribution of current and future suitable habitat on and off the installation, the quality of the habitat, the current size and distribution of the T&E species population, the land use and ownership patterns, the recovery potential, and the species Recovery Plan objectives. The goal should strike a reasonable balance between the present and future installation and tenant unit missions and conservation. Once established, the population goal will determine the amount of installation land to be managed as T&E species habitat. Goals should be considered long-term but are subject to change, through consultation with the FWS, based upon changing circumstances and new scientific information.

The population goal established for an installation will dictate the required species management intensity level. A population that has achieved the installation goal need only be maintained at that level; however, installations should continue to encourage population growth where feasible and compatible with the military mission. In contrast, any population that has not achieved its population goal requires an active recruitment/augmentation strategy. A maintenance strategy is

appropriate for populations that have attained the maximum population that can be supported by available suitable habitat, regardless of population size. However, maintenance activities will vary according to the population size (e.g., smaller, nonviable populations may require occasional augmentation, predator control, etc.).

Population goals should be established by first estimating the size of the listed and proposed T&E species population using accepted biological sampling methods. The sampling methods should be reviewed and approved by the FWS or NMFS. The habitat in which the species occurs on the installation may be compared to similar habitats at other locations within the species range in which the listed and proposed T&E species populations are healthy and prospering in order to determine the quality of the habitat on the installation for the listed and proposed T&E species. In some cases, habitat and population data on listed and proposed T&E species will be difficult to obtain or will not be available. In these instances, the recommendations of species experts should be obtained. Experts may be found in the FWS, NMFS, other Federal and State natural resource management agencies, universities, and nongovernmental natural resources and environmental organizations. During this investigation, it may be that the habitat on the installation was found to be adequate for the species' needs, or it could be that the habitat is deficient or degraded in some areas that could be restored or enhanced.

It should be recognized that the conservation goals established for a species may require the management for more than one listed or proposed T&E species that occupies the same habitat. The prescriptions and actions taken to manage these species should be designed to ensure compatibility and avoid adverse impacts. ESMPs should support a community-based management approach to provide benefits to multiple species.

DoD Memo
8 Aug 94

The reintroduction and introduction of listed, proposed, and candidate species are viable conservation and management options. However, they must meet the requirements of AR 200-3, 11-14 (Reintroduction and introduction of listed, proposed, and candidate species).

The FWS or NMFS should be involved early in the process of developing the ESMP to help establish conservation goals for listed and proposed T&E species. Early consultation will assure that the goals will balance mission requirements with the requirements of the ESA.

3.11 Management Prescriptions and Actions

This section should contain area-specific management prescriptions and actions needed to meet the conservation goals for the listed and proposed T&E species and/or any critical habitat. Management prescriptions and actions should be based on current scientific knowledge of the species. Management prescriptions and actions included in this section will be consistent with any discretionary

AR 200-3,
11-5b(3)

AR 200-3,
11-5b(4)(d)

conservation recommendations provided within an FWS or NMFS biological opinion. ESMPs will be consistent with MACOM or HQDA ESMGs or other MACOM or HQDA guidance as applicable, unless FWS or NMFS biological opinions require otherwise. MACOM or HQDA ESMGs are intended to provide sufficient written guidance to avoid duplication of effort, promote uniformity of management practices wherever feasible, promote efficient use of resources, and provide appropriate MACOM or HQDA coordination and oversight. Management prescriptions will address balancing mission requirements with the conservation of listed and proposed T&E species. Examples of management prescriptions, and actions are provided in Section 4.0 of Appendix A.

AR 200-3,
11-7e(5)

AR 200-3,
11-5b(3)

AR 200-3,
11-5c

AR 200-3,
11-5d

Clearly define activities (e.g., inventories, biological assessments) and management actions (e.g., marking trees, performing controlled burns, thinning of stands) that are directed toward achieving management objectives. Management actions consist of one or more prescriptions to be carried out in clearly defined areas. Management objectives are developed to assist in meeting conservation goals.

While the FWS (FWS 1990) and NMFS have established policies relating to recovery activities for listed T&E species populations, the "emphasis should be on preservation of natural habitats, population management, enforcement of protective regulations, and public education" (FWS 1986). The conservation recommendations of habitat preservation, population management, enforcement, and education are supported by the Army goal to conserve biological diversity on Army lands within the context of its mission.

AR 200-3,
11-1c

The specific management actions necessary to meet goals for the species and critical habitat may include mission requirements management (e.g., limitations of certain activities with regard to season, establishment of restricted areas, or restriction of certain activities in designated areas), habitat management (e.g., protection, improvement, and development), and population management (e.g., protection of individuals and population augmentation). Modification of existing plans and installation activities may be necessary in order to accomplish the goals of the ESMP. The use of an ecosystems management approach is encouraged. This management approach is most effective where sufficient knowledge of the species exists or where management for multiple species is required. Conflicts in management needs may arise where more than one listed and proposed T&E species occurs on an installation. A decision from the FWS or NMFS will be necessary to resolve such situations.

DoD Memo
8 Aug 94

Education of DA personnel will be achieved by the establishment of an awareness training program on installations with listed and proposed T&E species or critical habitat. A mandatory ongoing training program for personnel who may have contact with listed and proposed T&E species or their habitats will be established and implemented by the appropriate directorate. Specific requirements for training and implementation will be identified in the ESMP.

AR 200-3,
11-10

3.12 Monitoring Plan

This section should describe the installation's plan to periodically estimate population size, habitat size and suitability, and any other aspects of population vigor that may be appropriate (e.g., presence of disease or abnormalities related to inbreeding, projected shifts in availability of suitable habitat, trends in predator or prey abundance, etc.). This information is crucial to the installation's ability to determine if conservation goals are being achieved. Elements of the plan, including the frequency of field inventory, will depend on the species and its habitat.

AR 200-3,
11-5b(4)(f)

3.13 Time, Costs, and Personnel

This section will provide estimates of the time, costs, and personnel needed to carry out those measures needed to achieve the conservation goals. Installation commanders are responsible for ensuring that adequate professional personnel and funds are provided for conservation measures prescribed by ESMPs and ESMGs. Commanders are responsible for accurately identifying the funding needed to meet the requirements of applicable ESMGs. Listed and proposed T&E species management projects are funded through environmental channels and are included in the Environmental Compliance Achievement Program (ECAP) RCS-1383 reporting process. The funding and reporting guidance for these projects is detailed in "Policy and Guidance for Identifying U.S. Army Environmental Program Requirements, Volume II," issued in July 1993 by the Office of the Director of Environmental Programs (DA 1993). Since this guidance is subject to frequent change, it is important to consult the most current RCS-1383 guidance when submitting and updating installation RCS-1383 reports. Information on the most current guidance is available from the U.S. Army Environmental Center's Environmental Response Line at 1-800-USA-EVAL (1-800-872-3825).

AR 200-3,
11-13

Broad reportable expenditure categories include costs for work performed by contract or in-house personnel and for materials, equipment, and supplies needed for a project. More detailed categories include listed and proposed T&E species surveys, training and monitoring, program administration, biological assessments, informal and formal consultation with the FWS or NMFS, and developing, revising, and implementing ESMPs.

Coordination in the recording of costs and cost categories between the ESMP and the RCS-1383 reporting process can streamline reporting efforts. A table format can be used to summarize the required, budgeted, and obligated annual and total costs associated with an ESMP. This can expedite the compilation of cost information for reporting T&E species expenditures to MACOM and HQDA, as well as providing easy input into the Army Compliance Tracking System. This tracking system is used in the preparation of an annual report on T&E

species expenditures required by the FWS. An example of a funding summary is presented in Section 6.0 of this document in Appendix A.

3.14 Checklist

A checklist will be developed for assessing installation compliance with ESMPs. The checklist should identify actions, tasks, and steps required to implement the ESMP over its projected life. Objective milestones for achieving conservation goals also will be developed and included in the checklist, as well as the primary conservation measures specified in the ESMP. Checklist items should also incorporate the review of other installation plans or programs (master plan, forest management plan, annual training plan and testing or exercise, outdoor recreation plan) that could be affected by implementation of the ESMP. This would ensure the integration of ESMP efforts into these other plans or programs and avoid potential conflicts between plan actions and potential violations of the ESA.

AR 200-3,
11-5b(4)(h)

The checklist is intended to be the primary tool used in assessing installation compliance with ESMPs. A well-designed checklist will serve as a stand-alone guide for those conducting the assessment. A useful tool for developing a checklist is the step-down outline presented in FWS recovery plans. While no particular format is required, checklists should include a brief narrative explanation for each point on the checklist and a cross-reference to the pertinent ESMP provision. The checklist should be revised as necessary after each review of the ESMP.

Additional items that could be included in the checklist are task or action priorities based on conservation or funding needs, expected duration of a task or action and its status (e.g., ongoing, continuous, or completed), and the entity responsible for the task or activity (e.g., environmental directorate, SJA, EQCC).

3.15 References

Cite the bibliographic references for all citations in the text. An acceptable format for bibliographic reference is that used by The Wildlife Society or The Council of Biological Editors (CBE Style Manual Committee 1983).

3.16 Appendices/Exhibits

When information needs to be included in the document to support the statements in the text, but would be cumbersome in the body of the ESMP, put it in an appendix/exhibit.

One appendix/exhibit (titled "Individuals and Organizations Contributing to the Plan") should identify all groups and individuals who were

consulted in the process of preparing the ESMP, including formal and informal consultations with other agencies. At a minimum, this section should include the groups and individuals mentioned in Section 2.1 of this document. This could include, but not be limited to, the installation ESMP team, EQCC members, MACOM and HQDA personnel, other Department of Defense entities outside HQDA, and those responsible for management of Federal, state, or private lands adjacent to an installation. Conservation agreements with the FWS or NMFS and cooperative agreements with state authorities to conserve state-listed species should be referenced here. This record of preparers, cooperators, and agreements will provide important points-of-contact for continuing installation efforts toward listed and proposed T&E species conservation. Additionally, this section can serve as a record of consultation for compliance with Section 7 of the ESA.

4.0 GLOSSARY

Anadromous fish

Fish that spend most of their lives in salt water but migrate into fresh water to spawn; e.g., salmon, shad, and striped bass.

Biological assessment

The information, prepared by or under the direction of the Federal agency concerning listed and proposed species and designated and proposed critical habitats, that may be present in the action area and the evaluation of potential effects of the action on such species and habitats.

Candidate species

Species that the FWS is considering for addition to the threatened and endangered list but has not yet actually proposed for listing [47 *FR* 58454-58460 (1982)].

Category 1 Candidate Species

Taxa for which the FWS has on file substantial information on biological vulnerability and threats to support the appropriateness to list them as endangered or threatened species. Included are those taxa whose status in recent past is known, but may have already become extinct.

Conserve/Conservation

To use/the use of all methods and procedures to bring any endangered species or threatened species to the point at which the measures provided pursuant to the ESA are no longer necessary.

Critical habitat

"(i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of ... (the ESA), on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and

(ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of ... (the ESA), upon a determination by the Secretary (of the Interior) that such areas are essential for the conservation of the species." (ESA 1973)

Endangered species

Any species listed, pursuant to the ESA, which is in danger of extinction throughout all or a significant portion of its range.

Endangered Species Management Guidelines (ESMG)

Guidelines issued by MACOMs or HQDA to promote effective management of listed and proposed species on Army installations.

Endangered Species Management Plan (ESMP)

A plan developed in accordance with DA Memorandum: Guidance for Management of Endangered/Threatened Species (26 Jan 1993) by installations for the management of listed or proposed species or critical habitat.

Jeopardize the continued existence of

To engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.

Listed species

Any species of fish, wildlife, or plant that has been determined to be endangered or threatened under Section 4 of the ESA. Listed species are found in 50 *CFR* 17.11-17.12.

Metapopulation

A term used to describe several populations of a species that are related through infrequent breeding.

Proponent

Proponent identification is dependent on the nature and scope of a proposed action as follows: (1) Any Army structure may be a proponent. For instance, the installation/activity Facility Engineer (FE)/Director of Engineering and Housing becomes the proponent of installation-wide Military Construction Army (MCA) and Operations and Maintenance (O&M) Activity; Commanding General, U.S. Army Training and Doctrine Command (TRADOC) becomes the proponent of a change in initial entry training. The proponent may or may not be the preparer. (2) In general, the proponent is the lowest level decisionmaker. It is the unit, element, or organization that is responsible for initiating and/or carrying out the proposed action. The proponent has the responsibility to prepare and/or secure funding for preparation of the environmental documentation.

Proposed critical habitat

Habitat proposed in the *Federal Register* to be designated as critical habitat for any listed or proposed species.

Proposed species

A fish, wildlife, or plant species that is proposed by the FWS in the *Federal Register* to be listed as endangered or threatened under the ESA.

Recovery Plan

A document that delineates, justifies, and schedules the research and management actions necessary to support recovery of a species, including those actions that, if successfully undertaken, are likely to permit reclassification or delisting of the species.

Recruitment

The designation and management of habitat for the purpose of attracting T&E populations to that habitat area.

Threatened species

Any species listed pursuant to the ESA which is likely to become an endangered species within the foreseeable future, throughout all or a significant portion of its range.

Translocation

The relocation of one or more individuals from a given population to another area of equally suitable habitat.

5.0 REFERENCES/BIBLIOGRAPHY

Army Regulation (AR) 200-1. *Environmental Quality, "Environmental Protection and Enhancement,"* Department of the Army, effective 23 May 1990.

Army Regulation (AR) 200-2. *Environmental Quality, "Environmental Effects of Army Actions,"* Department of the Army, effective 23 January 1989.

Army Regulation (AR) 200-3. *Environmental Quality, "Natural Resources - Land, Forest, and Wildlife Management,"* Department of the Army.

CBE Style Manual Committee 1983. *CBE Style Manual*. 5th ed. Council of Biological Editors.

Department of the Army (DA) 1993. *Policy and Guidance for Identifying U.S. Army Environmental Program Requirements, Volume II*. Office of the Director of Environmental Programs. July 1993.

Department of Defense Memorandum 1994. *SUBJECT: Implementation of Ecosystem Management in the DoD*. Office of the Deputy Under Secretary of Defense. 8 August 1994.

Endangered Species Act (ESA) 1973. (as amended 16 USC 1531, et seq).

National Environmental Policy Act (NEPA) 1969. (as amended 42 USC 4321, et seq).

U.S. Fish and Wildlife Service (FWS) 1992. *Endangered and Threatened Species of the Southeast United States* (The Red Book), prepared by Ecological Services, Division of Endangered Species, Southeast Region, U.S. Government Printing Office, Washington, DC, 1,070 pp.

U.S. Fish and Wildlife Service (FWS) 1990. *Policy and Guidelines for Planning and Coordinating Recovery of Endangered and Threatened Species*, U.S. Department of the Interior, Fish and Wildlife Service.

U.S. Fish and Wildlife Service (FWS) 1986. *"Treatment of Cultivated Material of Listed Plant Species,"* Memorandum from Director to Regional Director, Region 3, January 14, 1986.

Appendix A

Example Plan

The following example plan is based on the information for a real species, the red-cockaded woodpecker, as it might occur on a hypothetical installation. Its purpose is to illustrate how a plan may look once it is prepared consistent with guidance set forth in AR 200-3: Chapter 11.

This plan uses AR 200-3: Chapter 11, the existing HQDA Endangered Species Management Guidelines (ESMG) for the red-cockaded woodpecker, and the U.S. Fish and Wildlife Service's Recovery Plan for this species. These regulations, guidelines, and plan are referenced throughout the example plan. In most cases, HQDA or MACOM guidelines will not exist for listed and proposed T&E species on installations. However, the lack of ESGMs should not deter installations from developing similar, installation-specific threatened and endangered species management standards, protocols, goals, objectives, and other elements for inclusion in ESMPs.

APPENDIX A-EXAMPLE PLAN

APPENDIX A-EXAMPLE PLAN

Endangered Species Management Plan
for the
Red-cockaded Woodpecker (*Picoides borealis*)

Fort McDonald, South Carolina

prepared by
Frank B. Adams
Endangered Species Biologist
Fish and Wildlife Branch
Directorate of Engineering and Housing

1 October 1994 - 30 September 1995

APPENDIX A-EXAMPLE PLAN

APPENDIX A-EXAMPLE PLAN

Approving Official:

INSTALLATION COMMANDER

Date

Reviewed by:

CHIEF, ENVIRONMENTAL DIRECTORATE

Date

STAFF JUDGE ADVOCATE

Date

APPENDIX A-EXAMPLE PLAN

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APPENDIX A-EXAMPLE PLAN

Acronyms/Abbreviations

| | |
|-------|---|
| BA | basal area |
| DA | Department of the Army |
| DAID | Delayed Aerial Ignition Service |
| DBH | Diameter Breast High |
| ECO | Environmental Compliance Officer |
| ENRMD | Environmental and Natural Resources Management Division |
| ESA | Endangered Species Act of 1973 |
| ESMG | Endangered Species Management Guidelines |
| ESMP | Endangered Species Management Plan |
| FR | Federal Register |
| FWS | U.S. Fish and Wildlife Service |
| GIS | geographic information system |
| HMU | habitat management unit |
| HQDA | Headquarters, Department of the Army |
| IAW | In accordance with |
| MPRC | Multi-purpose Range Complex |
| RCW | Red-cockaded woodpecker |
| SOP | standard operating procedure |
| USFS | U.S. Forest Service |

APPENDIX A-EXAMPLE PLAN

EXECUTIVE SUMMARY

Background: Army regulations (AR 200-3) require the preparation of Endangered Species Management Plans for listed and proposed threatened and endangered species and critical habitat present on installations. All Army land uses are subject to these regulations. Compliance with Chapter 11 of AR 200-3 involves coordination with other Federal agencies responsible for the protection of these species. Failure to implement this management plan can lead to violation of the Endangered Species Act of 1973 (ESA) and result in the costly disruption of military operations.

Current Species Status: The red-cockaded woodpecker (RCW) (*Picoides borealis*, formerly *Dendrocopos*) is listed as endangered by the U.S. Fish and Wildlife Service (FWS). Four RCW clusters are known to be present in a 915-acre forested area near the western boundary of Fort McDonald. The species is present primarily in the piedmont and coastal plain of the southeastern United States. The species is vulnerable to several threats on the installation: timber harvest, forest clearing, and habitat degradation through fire suppression.

Habitat Requirements and Limiting Factors: The primary limiting factor is availability of suitable nesting trees - mature longleaf pine trees (greater than 100 years old) that are living but have decay in the heartwood.

Management Objectives: Management will be for protection and enhancement of existing populations on the installation and expansion into unoccupied suitable habitat. Fort McDonald is also cooperating in establishing a habitat corridor linking the Fort's RCW population with a larger population in McDonald State Forest.

Conservation Goals:

- 1) A 915-acre forested area on Fort McDonald currently supports 4 clusters (3 active and 1 inactive) of the RCW at a density of one cluster per approximately 229 acres. A forest inventory at Fort McDonald indicated that 4,142 acres of suitable RCW foraging and nesting habitat exists on the installation, which includes the 915 acres currently occupied and 3,227 acres of potentially suitable habitat (recruitment area). The 4,142 acres will be designated as the RCW Habitat Management Unit (HMU) for the installation.
- 2) The installation RCW population goal has been established at 14 clusters; 4 existing with a potential of 10 more in the recruitment area. The population density goal will be one cluster per 300 acres.
- 3) The only installation or tenant unit mission requirements in the vicinity of the RCW HMU are the Multi-purpose Range Complex (MPRC) and the proposed expansion of the MPRC. These areas will not be a part of the HMU because their purpose is incompatible with RCW habitat requirements. These areas were designated as critical mission areas that cannot be relocated due to the fact that remaining installation land is either swamp or wetlands, or built-up areas for other purposes.
- 4) Fort McDonald is cooperating with the U.S. Fish and Wildlife, McDonald State Forest, and Jackson Timber Company to promote the joining of the Fort McDonald RCW population with a larger RCW population on McDonald State Forest. This will be accomplished by Jackson Timber Company establishing a managed corridor on their land, linking the two managed populations on Fort McDonald and McDonald State Forest. Larger populations of the RCW on contiguous areas are a goal of the RCW Recovery Plan.

APPENDIX A-EXAMPLE PLAN

Actions Needed: The major steps needed to satisfy management objectives and achieve conservation goals are:

- 1) Prescribed burn of the cluster areas every third year. Rake and/or preburn around cavity trees prior to burning of the entire area.
- 2) Thin the stand density in the clusters to 50 to 80 sq. ft per acre and maintain a spacing of 20 to 25 ft between trees.
- 3) Control of hardwoods within the clusters, including selective removal of large hardwoods near nest trees and manual clearing of midstory.
- 4) Site-specific exclusion of logging and cultural treatments in active clusters during the nesting period.
- 5) Management of clusters as individual forest compartments. Clusters will not be fragmented from adjacent stands by timber harvest or other management activities.
- 6) Retention of sufficient contiguous pine or pine-hardwood stands within a half-mile radius of each cluster to provide at least 8,490 sq. ft of basal area, including at least 6,350 pine stems greater than 10 in. diameter breast high.
- 7) Construction of artificial cavities and augmentation of single-bird groups.
- 8) Implementation of a monitoring plan that will include a five-year installation-wide RCW survey, annual nest productivity monitoring, annual inspections of habitat in identified RCW clusters, and a 10-year forest survey.

Total Estimated Cost of Conservation Actions: Projected costs for the first five years of this plan are: Year 1) \$\$. \$\$; Year 2) \$\$. \$\$; Year 3) \$\$. \$\$; Year 4) \$\$. \$\$; and Year 5) \$\$. \$. Table 6 provides a breakdown of cost per year by activity.

1.0 INTRODUCTION (AR 200-3: 11-5; HQDA ESMG; RCW Recovery Plan)

The purposes of this Endangered Species Management Plan (ESMP) are: (1) to present information on the red-cockaded woodpecker (RCW), a federally listed endangered species present at Fort McDonald; (2) to discuss the threats it faces on the installation; (3) to define conservation goals; and (4) to outline a plan for management of the species and its habitat that will enable achievement of conservation goals. These purposes are consistent with the U.S. Fish and Wildlife Service (FWS) RCW Recovery Plan (Exhibit D). Cost of the conservation efforts and impacts to other installation activities will also be discussed.

The RCW is a medium-sized woodpecker that feeds primarily on insects in mature pine stands and nests in mature pine trees that have decaying heartwood. The species is distributed primarily in the piedmont and coastal plain of the southeastern United States and is present in 22 counties in South Carolina.

Population decline is the reason for listing this species as endangered. Logging or clearing of suitable nesting trees, decline of pine stands from infestations of beetles, and fire suppression have resulted in the habitat loss that is considered the cause of the decline. Without appropriate management of the species and its habitat, the species will probably continue to decline.

This ESMP is based on and is consistent with the following laws, regulations, and guidelines: Endangered Species Act of 1973 (ESA); Army Regulation (AR) 200-3; Headquarters, Department of the Army Endangered Species Management Guidelines (HQDA ESMGs) for the Red-cockaded Woodpecker; and the FWS Red-cockaded Woodpecker Recovery Plan.

2.0 SPECIES INFORMATION (AR 200-3: 11-5; HQDA ESMG: V.A.)

This section provides a description of the species, including distribution, habitat/ecosystem, life history, evidence for its decline, and conservation measures taken by various agencies or organizations.

Description - The RCW is a medium-sized bird, 8-in. tall, with a black cap and nape and a large white cheek patch; the back is barred black and white. Adult males have a red patch near the eye, but the patch is seldom visible even with the aid of binoculars. The hairy woodpecker (*Picoides villosus*) and downy woodpecker (*Picoides pubescens*) are similar in appearance and occur in the same geographic area as the RCW. The best distinguishing characteristics between the RCW and hairy woodpecker are the large white cheek patch on the RCW and the white mid-dorsal stripe and longer bill of the hairy woodpecker. The downy woodpecker also has a white mid-dorsal stripe and is smaller than the hairy woodpecker. The vocalizations of the RCW are a rough, rasping *sripp* or *zhilp* and sometimes a higher *tsick* (Peterson, 1980). The species was listed as endangered in accordance with the ESA by the FWS October 13, 1970 (35 FR 16047). More technical descriptions of the species are provided by Jackson (1971), Crosby (1971), and Ligon (1970).

Distribution - The RCW is currently distributed throughout its historic range, except southern Missouri where it has not been reported since 1960 (Figure 1), but its density within the historic range has declined dramatically (Jackson 1971). Populations are also more fragmented within its historic range.

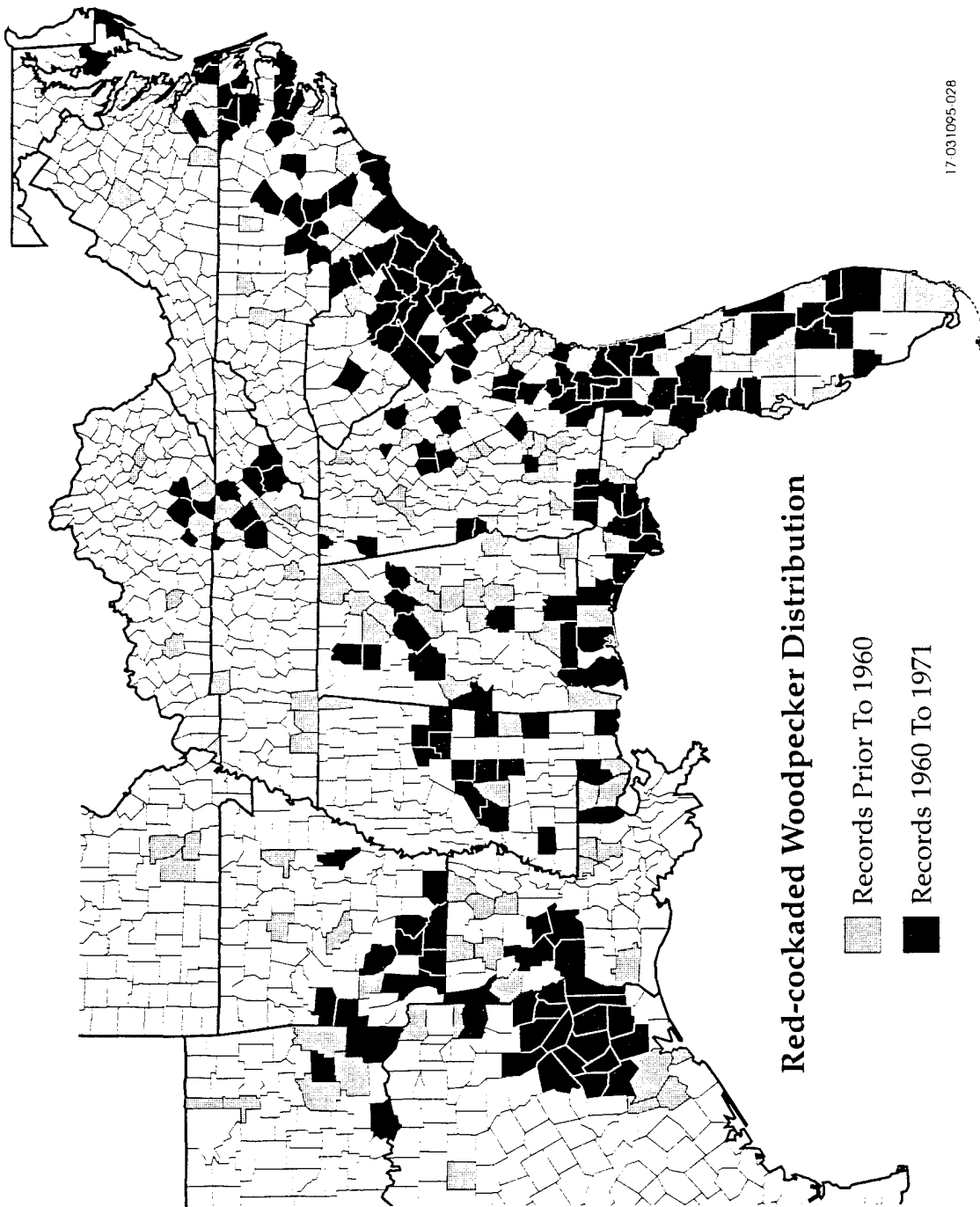


Figure 1. Distribution of the Red-cockaded Woodpecker in the Southeastern United States

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At the present time, the largest population of RCWs close to Fort McDonald is approximately 5 miles away in McDonald State Forest. That population is composed of 30 active clusters and 10 inactive clusters. Jackson Timber Company currently manages a tract of land 1.6 miles long between Fort McDonald and McDonald State Forest (Figure 2). No RCWs currently occupy the Jackson Timber Company land. FWS recovery plan goals are 100 clusters for the McDonald State Forest population.

A 915-acre forested area at Fort McDonald supports 4 clusters (3 active and 1 inactive) of the RCW at a density of one cluster per approximately 229 acres (Figure 2). Cluster 1 (active) is approximately 207 acres and has 2 cavities and 2 cavity starts; Cluster 2 (active) is approximately 214 acres with 3 cavities and 1 start; Cluster 3 (active) covers about 243 acres and has 5 cavities and 3 starts; Cluster 4 (inactive) covers about 200 acres and has 4 cavities.

Habitat/Ecosystem - The RCW occurs in pine or mixed pine-hardwood forests primarily in the piedmont and coastal plain of the southeastern United States. Forests inhabited by the RCW have historically been controlled by fire, either intentional burns set by humans or by naturally occurring wildfires. Fire enables maintenance of the ecosystem; without fire, dense understory vegetation negatively affects the establishment of young pine trees (Stoddard 1962).

The RCW is habitat-specific—for nesting and roosting it requires living mature pine trees, preferably those that are infected with heart rot, caused by the fungus *Formes pini*. This disease facilitates excavation of the tree by the RCW by softening the heartwood. The RCW prefers areas with an open understory vegetation. Insects and small arthropods constitute its diet, and feeding is typically in the upper regions of large pines, although females tend to forage lower. Fruits and mast are also consumed by the RCW in an opportunistic fashion. Individuals move from tree to tree during feeding and cover a large area during the course of a day.

Life History/Ecology - The RCW is a nonmigratory, territorial, cooperative breeder. Often, the species segregates into groups, which consist of either a solitary, territorial male, a mated pair, or a pair with their helpers (offspring from previous years). A cluster is defined as the area prescribed by a collection of start holes and cavities (roost, nest, and old) habitually used by a group plus a 200-ft buffer zone. There may be numerous cavities within a cluster, but there is only one breeding pair per group.

RCW individuals that mate apparently mate for life. Eggs are laid in nest cavities in clutches of 2–7. Incubation begins before the clutch is complete, thus, the hatch of the young is staggered. One to four young are fledged at 26 to 29 days of age. Although young forage for themselves a few days after fledging they may continue to receive food from the parents for several months (Mosby 1972).

Reasons for Listing - Population declines have resulted primarily from reduction in forests with suitable trees for the roosting and nesting of the RCW. Economic use of a forest typically involves the harvesting of trees before heart rot has affected them. Clearing of forest has also reduced available stands with suitable nest trees. Fire suppression or an improperly implemented fire regime may also have contributed to decline.

Conservation Measures - The FWS has developed and is implementing a recovery plan for the RCW (FWS 1985). The plan calls for management of forest stands to enhance habitat for the

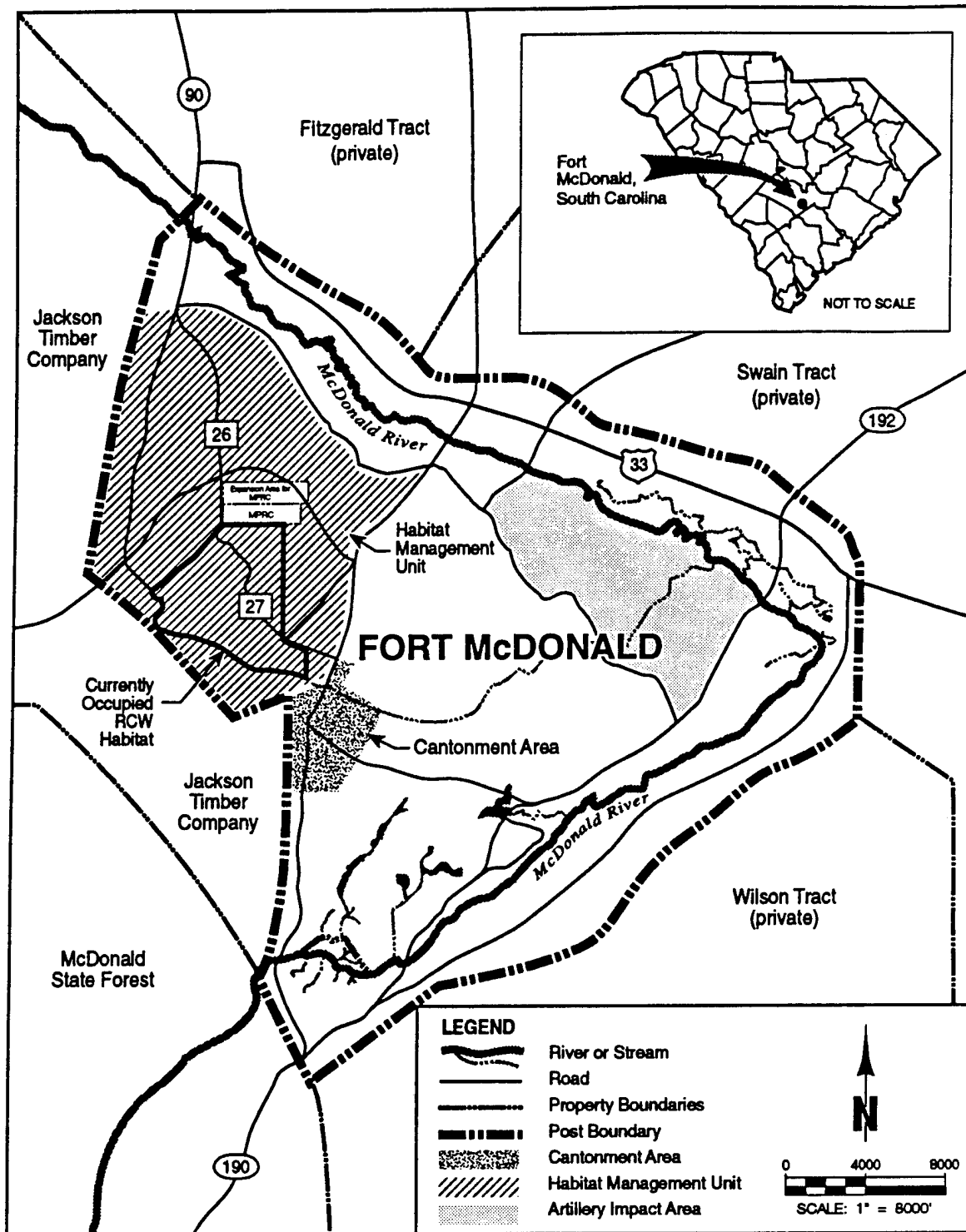
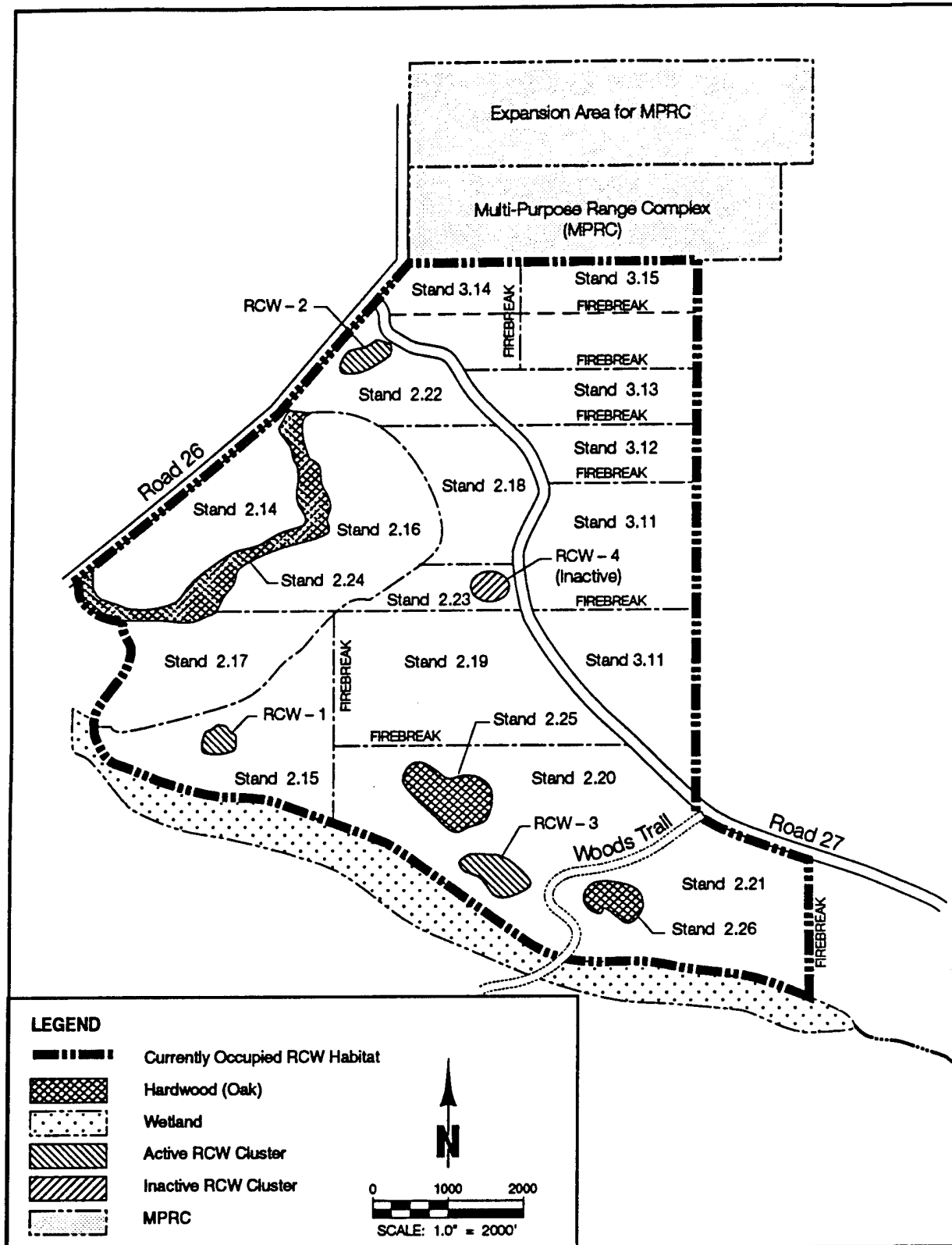


Figure 2. Location of the Red-cockaded Woodpecker on Fort McDonald

species. Several paper companies that own large tracts of land in the coastal plain are voluntarily managing sections of their forest for habitat enhancement. In addition, the following Department of Defense installations now have ongoing management plans for RCW: Fort Stewart, Fort Benning, Fort Jackson, Fort Polk, Eglin Air Force Base, and Avon Park Air Force Range.

3.0 CONSERVATION GOALS (AR 200-3: 11-5; HQDA ESMG: III.A., III.F., III.G., III.H., V.B.; RCW Recovery Plan)

1. A complete survey of Fort McDonald was completed in the Spring of 1994 to determine the amount of suitable RCW habitat on the installation and the density of any RCWs on that area. Three active and one inactive RCW clusters were identified. Their distribution is depicted in Figure 3.
2. Based on the 1994 Installation Forest Inventory, Fort McDonald has a total of 4,142 acres of suitable RCW foraging and nesting habitat. This area includes the 915-acre forested area on which clusters have been identified, and a 3,227-acre area which is suitable RCW habitat, but at the present time has no clusters. This entire 4,142-acre area will be designated the RCW Habitat Management Unit (HMU), with the 3,227-acre tract managed as a recruitment area. The remaining land on Fort McDonald is composed of approximately 9,000 acres of old rice fields, 10,000 acres of lowland swamp and wetlands, and 5,500 acres of permanent facilities (i.e., roads, buildings, and other structures), and is not suitable or potentially suitable for RCW nesting or foraging habitat.
3. The installation RCW population goal has been established at 14 clusters; 4 existing, with a potential of 10 more in the recruitment area. This goal was established jointly by the installation ESMP team (see Exhibit B) and the FWS. It recognizes the need for flexibility on training lands by prescribing a population density of 1 cluster per 300 acres rather than the 1 cluster per 200-acre density which is the biological standard in the absence of conflicting land use requirements.
4. The only installation or tenant unit mission requirements in the vicinity of the RCW HMU are the Multi-purpose Range Complex (MPRC) and the proposed expansion of the MPRC. The MPRC is located directly north of the area currently occupied by the RCW clusters, while the expansion of the MPRC will be north of the existing MPRC.
5. Due to the nature of the activities that occur on the MPRC, and are anticipated to occur on the proposed expansion of the MPRC, these areas have been designated as having mission requirements that are incompatible with conservation of the RCW. Also, the land occupied by the MPRC and the proposed expansion of the MPRC is at the present time devoid of trees and would require considerable time to be fully developed as potential RCW habitat. Therefore, the MPRC and expansion of the MPRC will not be considered as part of the RCW HMU.
6. It has been determined that in the areas where there are conflicting mission (i.e., MPRC and proposed expansion of the MPRC) and RCW habitat requirements, these conflicting mission requirements cannot be relocated. No other suitable areas for the Range Complexes exist, either due to the nature of the land (i.e., swamp or wetlands) or pre-existing land use (i.e., built up areas, etc.).



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Figure 3. Currently Occupied Red-cockaded Woodpecker Habitat

7. The MPRC and expansion of the MPRC have been designated as critical mission areas that cannot be relocated.

8. No training activities will be required within the HMU that will be incompatible with RCW conservation.

9. Representatives from Fort McDonald, the FWS, McDonald State Forest, and Jackson Timber Company are discussing ways in which the larger RCW population on McDonald State Forest can be joined to the smaller RCW population on Fort McDonald. This will be accomplished by Jackson Timber Company managing a 1.6-mile-long corridor on its land between the State Forest and the Fort as suitable RCW nesting and foraging habitat. This will allow individuals from the State Forest population and the Fort population to potentially become one large population in several years. Larger populations of the RCW on contiguous areas are a goal of the RCW Recovery Plan.

10. At the present time, there is no need to translocate individuals. Natural expansion of existing populations is expected to be sufficient to promote growth in the regional population of the species.

4.0 MANAGEMENT PRESCRIPTIONS AND ACTIONS (AR 200-3: 11-5)

The management prescriptions and actions incorporated within this ESMP were developed in accordance with the HQDA ESMG titled "Management Guidelines for the Red-cockaded Woodpecker on Army Installations" (21 June 1994). The actions included within this ESMP are considered to be necessary to achieve the conservation goals for the RCW at Fort McDonald. Most of these prescriptions and actions have been derived by the FWS and U.S. Forest Service (USFS) from the several years experience in working with the RCW since its listing. Management prescriptions for RCW habitat are detailed in Exhibit C.

Additionally, Fort McDonald will cooperate with the FWS and adjacent landowners in developing the regional conservation strategy provided by the existence of an RCW population on nearby McDonald State Forest. The Fort will enter into cooperative agreements with the Jackson Timber Company, the State Forest, South Carolina Department of Natural Resources, and the FWS to arrange for the management of an RCW habitat corridor across the timber company's land. This habitat corridor will link the two populations and allow the interchange of individual RCWs between the two existing populations. In time, these populations could expand into one large population.

4.1 HABITAT MANAGEMENT UNITS (HQDA ESMG: V.D.)

1. Designation of HMUs.

The RCW population goal for Fort McDonald has been determined to be the attainment of one cluster for every 300 acres within a single installation HMU. The current density of three active clusters and one inactive cluster within the 915 acres of currently occupied habitat and the management of an additional 3,227 acres of potentially suitable habitat for 10 additional clusters will meet this goal.

2. Areas Included within HMUs.

Delineation of HMU. An HMU of 4,142 acres has been designated on Fort McDonald (Figure 3). This HMU encompasses three active clusters and one inactive cluster in a central area of 915 acres. This area of currently occupied RCW habitat provides a minimum of 200 acres per cluster of suitable foraging habitat. The remaining area of the HMU is a 3,227-acre recruitment area.

The presence of trees bearing turpentine scars (catfaces) indicates that most stands within the HMU were worked for naval stores, and probably were grazed by cattle prior to acquisition by the Army in 1942. Historically, spring burns were likely a frequent occurrence. Although most prescribed fires for the last 50 years have been set in the winter, wildfires are not uncommon during the growing season. The integrity of the natural plant community appears to be largely intact. Wiregrass and associated groundcover species would benefit from a shift back to growing season burns, but one or two winter fires will be necessary to reduce fuel loads. Repeated thinnings over the last 50 years have eliminated most old-growth relicts. Some were nonmerchantable and continue to be suitable RCW cavity trees, although their numbers are less than desirable. Stands on the northeast side of Road 27 probably had a similar history, but they were converted to pine plantation management between 1964 and 1979. Site preparation eliminated most native grasses and forbs, as well as all old growth pines.

Most stands near Clusters 1, 2, and 4 were last burned in January 1992, while stands in the vicinity of Cluster 3 were last burned in January 1993. A thinning cut was under way in Stand 2.22 in 1992, so it was excluded from the burn to protect logging equipment. This stand, which encompasses Cluster 2, has developed a heavy rough since it was last burned in 1988. Stand 2.22 was thinned to a 60 basal area (BA) stocking in 1991-92. The average number of stems greater than 10 in. diameter breast high (DBH) in the stands near Cluster 2 is low (10 per acre) because of a heavy harvest of pole timber in 1985.

Pole sales conducted in Stands 2.19 and 2.21 in 1987 and 1989, respectively, reduced the stocking of stems greater than 10 in. DBH in these stands to about 20 stems per acre. None of these stands are over-stocked and no timber harvests are recommended for this area during the next 5 years. This will allow an increase in the number of pine stems greater than 10 in. DBH. By maintaining this surplus, it should be possible to provide sufficient foraging habitat for a fourth RCW cluster in Stand 2.23.

Stand 2.18 was thinned to a 60 sq. ft per acre BA stocking in 1991-92. The average number of stems greater than 10 in. DBH in stands near Cluster 4 is low (10 per acre) due to heavy harvest of pole timber in 1985.

Deletion of inactive clusters. A monitoring plan, as described in Section 5.0, will be implemented for the Fort McDonald RCW population. Part of the plan will include annual inspections of habitat in identified RCW clusters. After 5 years, the FWS will be consulted on any clusters that have been continuously inactive for that period of time.

Avoiding fragmentation of nesting habitat. The delineation of the HMU provides a contiguous area of nesting habitat for all active and proposed recruitment clusters.

Provision of adequate foraging habitat. Foraging management will be based on providing at least 200 acres of pine/pine-hardwood for each cluster. A letter from the FWS indicates that

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Fort McDonald will be in compliance using these criteria as outlined in FWS (1989), although the FWS is currently developing new criteria based on a minimum total BA of 10-in. diameter and larger pines. When the FWS finalizes this new management criteria, implementation criteria will be developed and included in the next revision of this ESMP. Current foraging habitat resources for each cluster are listed in Tables 1 through 4 and are shown in Figure 4.

3. Minimization of RCW Management Impacts on the Installation's Mission.

The HMU was delineated in conjunction with proposed plans for the expansion of the MPRC. Additional firing points, along with associated maneuver lanes, are proposed for an area east of Road 26 and north of the present MPRC. FWS concurrence with a Finding of Not Likely to Adversely Affect was received 12 February, 1995 (FWS log no. 5-1-239).

Fort McDonald proposes to manage an additional 3,227 acres of land as a recruitment area. This land surrounds the currently occupied 915-acre tract. This additional area will be managed to encourage an additional 10 RCW clusters. Designation of the 4,142-acre HMU will not significantly impact the installation's mission or operations.

4. Demographic and Genetic Interchange. (HQDA ESMG: V.D.)

A population of RCW exists to the southwest in nearby McDonald State Forest. Opportunities to establish habitat corridors to link the installation's RCW population with that in McDonald State Forest will be pursued in cooperation with the state, FWS, and a private landowner (Jackson Timber Company).

4.2 HMU MANAGEMENT PRACTICES (AR 200-3:11; HQDA ESMG: V.E.; DoD Memo)

1. Compatibility with Other Species.

Use of management practices consistent with the conservation of other federally-listed and candidate species. Actions described for RCW management shall be consistent with the conservation and management of other listed species that are determined to be present on the installation, to the maximum extent possible. Based on the opinions of recognized experts and informal consultation with the FWS Field Office, the following effects on other species are anticipated:

Federal Species: Details of management for the eastern indigo snake (*Drymarchon corais*) (status: threatened) are found in the eastern indigo snake ESMP. Management needs are generally compatible with those of the RCW, especially in the area of prescribed fire. The indigo snake ESMP provides for periodic monitoring of population trends. The RCW ESMP will be adapted as necessary if negative effects to the indigo snake are identified. The bald eagle (*Haliaeetus leucocephalus*) (status: endangered) will require that no burning will be conducted within 1,500 feet of an active eagle nest between October and May, unless the young have fledged.

State and Federal Candidate Species: The Bachman's sparrow (*Aimophila aestivalis*) (status: State S3; Federal C2), flatwoods salamander (*Ambystoma cingulatum*) (status: State endangered, Federal C2), mountain witch-alder (*Fothergilla major*) (status: State S1), and the sweet pitcher plant (*Sarracenia rubra*) (status: State S1) are found in the fire-maintained communities within the RCW HMU. Current knowledge of these species indicates that they

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Table 1. Foraging Resources for Cluster 1

| Stand | Acres* | Cavity Trees | Total Pine Basal Area* | Total Pine Stems > 10"* |
|--------------------|--------|--------------|------------------------|-------------------------|
| 2.14 | 29.3 | 0 | 2051 | 1172 |
| 2.15 | 69 | 4 | 5520 | 6678 |
| 2.16 | 27.7 | 0 | 1801 | 1108 |
| 2.17 | 49 | 0 | 3430 | 1862 |
| 2.19 | 23.2 | 0 | 1904 | 464 |
| 2.20 | 7.3 | 0 | 511 | 210 |
| 2.23 | 2 | 0 | 120 | 80 |
| Total | 207.5 | 4 | 14537 | 11574 |
| Required Minimum** | | | 8490 | 6350 |
| Surplus | | | 6047 | 5224 |

Table 2. Foraging Resources for Cluster 2

| Stand | Acres* | Cavity Trees | Total Pine Basal Area* | Total Pine Stems > 10"* |
|--------------------|--------|--------------|------------------------|-------------------------|
| 2.14 | 28.2 | 0 | 1974 | 1128 |
| 2.16 | 50.1 | 0 | 3257 | 2004 |
| 2.22 | 45 | 4 | 2700 | 450 |
| 3.12 | 7 | 0 | *** | *** |
| 3.13 | 18.5 | 0 | *** | *** |
| 3.14 | 42 | 0 | 4200 | 5081 |
| 3.15 | 23.4 | 0 | 2940 | 0 |
| Total | 214.2 | 4 | 17501 | 9068 |
| Required Minimum** | | | 8490 | 6350 |
| Surplus | | | 6518 | 2313 |

* Indicates acres, basal area, or stems designated as foraging habitat for this cluster, not total for the stand.

** Based on USFWS Guidelines (Henry 1989).

*** Stand less than 20 years old. Not suitable foraging areas for RCWs.

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Table 3. Foraging Resources for Cluster 3

| Stand | Acres* | Cavity Trees | Total Pine Basal Area* | Total Pine Stems > 10"* |
|--------------------|--------|--------------|------------------------|-------------------------|
| 2.19 | 61.8 | 0 | 5072 | 1236 |
| 2.20 | 131.6 | 8 | 9212 | 6580 |
| 2.21 | 49.2 | 0 | 3444 | 984 |
| Total | 254.7 | 8 | 17728 | 8800 |
| Required Minimum** | | | 8490 | 6350 |
| Surplus | | | 9238 | 2450 |

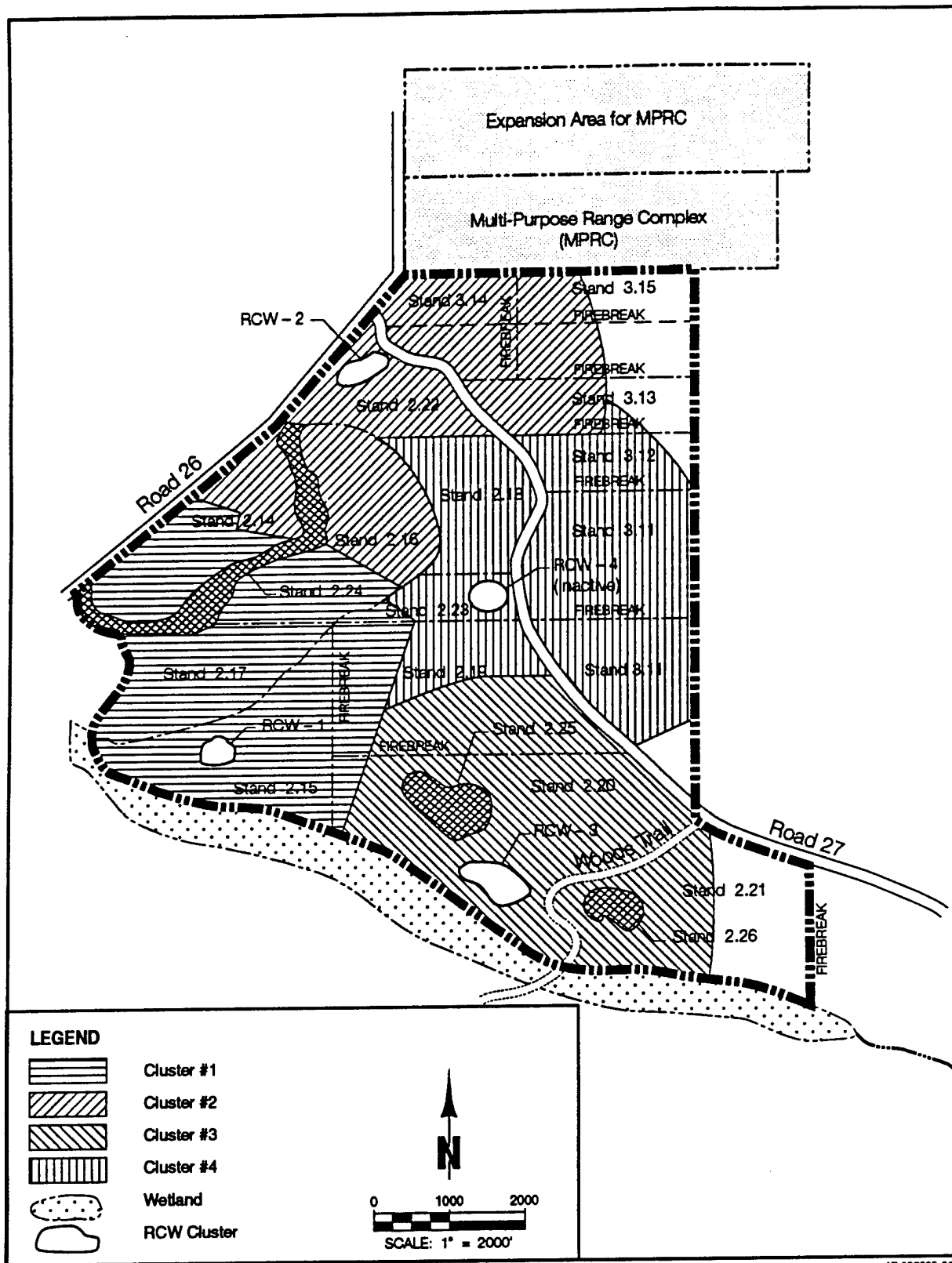
Table 4. Foraging Resources for Cluster 4
(Recruitment Stand)

| Stand | Acres* | Cavity Trees | Total Pine Basal Area* | Total Pine Stems > 10"* |
|--------------------|--------|--------------|------------------------|-------------------------|
| 2.18 | 48 | 0 | 2880 | 480 |
| 2.19 | 19 | 0 | 1558 | 380 |
| 2.23 | 19 | 5 | 1140 | 760 |
| 3.10 | 69 | 0 | 6900 | 2760 |
| 3.11 | 49 | 0 | 4900 | 2940 |
| 3.12 | 25 | 0 | *** | *** |
| 3.13 | 21.5 | 0 | *** | *** |
| Total | 250.5 | 5 | 17378 | 7320 |
| Required Minimum** | | | 8490 | 6350 |
| Surplus | | | 8888 | 970 |

*Indicates acres, basal area, or stems designated as foraging habitat for this cluster, not total for the stand.

** Based on USFWS Guidelines (Henry 1989).

*** Stand less than 20 years old. Not suitable foraging areas for RCWs.



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Figure 4. Red-cockaded Woodpecker Foraging Habitat

will benefit from the prescriptions in this plan. Management effects will be monitored and adaptations to this plan will be made, as appropriate, in consultation with the FWS.

2. RCW Clusters and Recruitment Stands within HMUs.

Management priority of clusters. Cavity tree locations and recruitment sites have been entered in forest compartment prescriptions to facilitate management. Timber sales or other forest management activities will not isolate these stands from adjacent stands. (Refer to Section 2.5 of the Fort McDonald Forest Management Plan, on file with the Forestry Branch, for more information). Newly discovered cavity trees will be mapped using the global positioning system and entered into the GRASS geographical information system (GIS) database. Priority will be given to the active Clusters 1,2, and 3.

Control of midstory growth. A program of hardwood midstory control shall be established. The Fort McDonald Fish and Wildlife Branch shall be responsible for implementation, with the Forestry Branch providing support for commercial thinnings and prescribed burnings. Prescribed burning at a maximum rotation of 3 years shall be the primary technique. Manual clearing of brush around cavity trees will be used where needed. Special sales of sweetgum will be used to reduce hardwood BA in RCW clusters and foraging habitat. Large hardwoods within 50 ft of cavity trees may be selectively removed and sold. Clusters will be evaluated, at least annually, to determine if additional hardwood control is required. Specific burn prescriptions for stands containing clusters are detailed in Exhibit C. The initial burn schedule for all stands within the HMU is depicted in Figure 5.

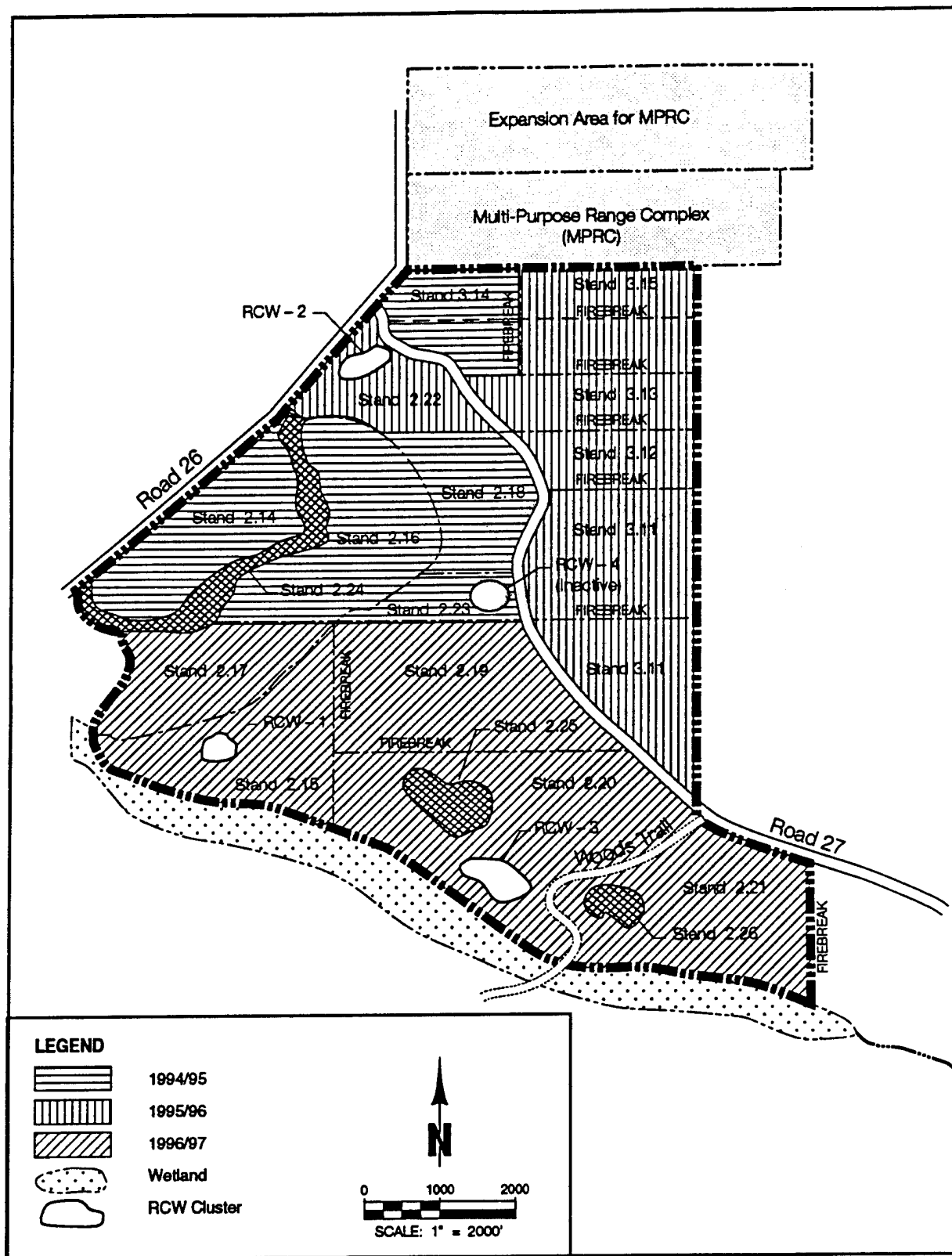
Forest management activities. Depending upon the type of military training being conducted in the area, RCW clusters and recruitment stands will be thinned to a BA between 50 and 80 sq. ft per acre, maintaining average spacing of 20 to 25 ft between trees. No rotation age will be set in these areas. A thinning prescription has been prepared for Stand 2.15 and is presented in Exhibit C. Additional information on timbering operations outside the RCW HMU may be found in Section 3.2 of the Fort McDonald Forest Management Plan, available from the Forestry Branch.

Southern pine beetle control. Southern pine beetle infestations will be controlled by salvage harvests and/or cut, pile, and burn treatments.

Disturbance of active clusters during the nesting season. The exclusion of logging and cultural activities in active clusters during the nesting period will be based on site determinations made by a biologist. These activities may be implemented during March if the biologist determines that nesting activities are not under way and may be implemented as early as late June if it is determined that the young have fledged and are foraging outside the cluster. Nesting data at Fort McDonald indicate that it is unnecessary to prohibit activity in colony sites for the entire March-July period. It is important to maximize use of this time period for RCW habitat management. This is especially true for erosion control efforts in clusters where success is dependent on establishing permanent grass cover before cold weather.

3. Other Areas (Foraging and Replacement Stands) within HMUs.

A combination of prescribed burning, hardwood timber sales, and manual clearing shall be used to control hardwood growth to eliminate dense midstory in foraging and replacement stands. Burn prescriptions for stands are detailed in Exhibit C.



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Figure 5. Red-cockaded Woodpecker Burn Schedule

4. Midstory Control.

The Fort McDonald Forestry or Fish and Wildlife Branch shall take necessary precautions to protect RCW trees and shall rake and preburn around active RCW trees prior to prescribed burning of the entire area. Treatment of RCW trees in areas susceptible to wildfire shall be expanded as resources become available. RCW clusters shall be prescribed-burned on a 2- to 4-year burning cycle on the Army-owned portion of Fort McDonald. Clusters and foraging habitat may also be burned at more frequent intervals, if necessary, to control the hardwood midstory. Burn prescriptions are detailed in Exhibit C. Herbicides may be cost-effective for localized application where hardwoods are well established in RCW clusters.

5. Erosion Control.

Surveys at cluster sites have been conducted. No active erosion or sedimentation was identified. If encountered, standard engineering practices will be applied to any areas receiving surface disturbances within the HMU from management, timbering, or training activities.

6. Impact/Danger and Direct Fire Areas.

The HMU is outside all duded impact areas. Some stands within the HMU are subject to wildfires caused by rounds impacting in adjacent stands. Maintenance of firebreaks and implementation of the burn schedule detailed within this plan will reduce the intensity and frequency of these wildfires. There are no anticipated impacts because no existing RCW clusters are within the MPRC surface danger zone. Earthen berms have been constructed on the MPRC and have stopped 90 percent of the fires; however, 10 percent damage downrange does occur. Such damage is infrequent and the habitat is well-suited for RCWs. If efforts are made to recruit RCWs into areas where occasional damage may occur, the annual monitoring program will be used to detect such damage and initiate remedial actions.

4.3 TIMBER HARVESTING AND MANAGEMENT IN HMUs (HQDA ESMG: V.F.)

Timber harvesting. Timber harvesting within the HMU will be conducted only as an adjunct prescribed habitat management technique. Stand improvement thinnings and/or longleaf pine reestablishment prescriptions have been prepared for Stands 3.14 and 2.15. Current conditions of other stands are suitable for RCW Clusters 1-4. Prescriptions have not yet been developed for the stands within the remainder (recruitment area) of the HMU. Inventories and stand prescription development are scheduled to begin in FY 1996 as required and appended to this plan.

Longleaf pine management. Stand 3.14 will be converted to longleaf pine. This stand is currently a slash pine plantation that was planted in 1964 and thinned in 1985. The stand has been winter burned at 1-to 2-year intervals since construction of MPRC in 1983. The desired future condition of this stand is conversion to uneven-aged longleaf pine, with small even-aged patches of varying size. A prescription for converting Stand 3.14 to longleaf pine is presented in Exhibit C.

Old-growth management. At a minimum, sufficient old-growth pine stands will be maintained by lengthening rotations to 120 years for longleaf pine and 100 years for other species of pine; indefinitely retaining snags, six to ten relict and/or residual trees per acre when doing a clearcut, seedtree, or shelterwood cuts; and indefinitely retaining snags, all relicts, and

residuals in thinning cuts. No rotation age will be established for recruitment cluster sites or replacement stands. The above rotation ages and retention rates do not apply to off-site stands of sand pine, loblolly pine, or slash pine that will be converted back to longleaf. These guidelines have been incorporated into the management prescriptions developed for stands within the HMU and into the Forestry Management Plan for stands and compartments that comprise the HMU.

4.4 PINE STRAW HARVESTING WITHIN HMUs (HQDA ESGM: V.G.)

No pine straw harvesting will be performed within the HMU in stands scheduled for burning within 12 months (see Exhibit C). This will ensure that sufficient pine straw will be available to allow for effective burning. All pine straw harvesting on the installation is and will be performed by hand.

4.5 RESTORATION AND CONSTRUCTION OF CAVITIES (HQDA ESGM: V.H.)

1. Restoration.

Data from the 1994 RCW cluster inspection indicate that no restoration of any active or inactive cavities is needed at this time. Cavity condition will be noted during monitoring activities and appropriate actions will be implemented as necessary in future years.

2. Construction.

Construction of artificial cavities and cavity starts in existing clusters will be performed in accordance with Allen (1991) and Copeyon (1990) and will be accomplished by fully trained personnel.

Artificial cavity and cavity start construction are recommended for the following clusters:

Artificial Cavity Prescription for RCW Cluster 1

Install two (2) artificial cavity boxes in the trees described below:

1. Longleaf pine, 18.5 in. DBH, located 3 chains from RCW cavity tree #2 at 235°.
2. Longleaf pine, 19 in. DBH, located 2 chains from RCW cavity tree #4 at 135°.

Artificial Cavity Prescription for RCW Cluster 2

Install one (1) artificial cavity box in the following tree:

1. Longleaf pine, 19.5 in. DBH, located 4 chains at 28° from RCW cavity tree #11.

Artificial Cavity Prescription for RCW Cluster 4

Install two artificial cavity boxes and three cavity starts in the following trees:

1. Cavity in longleaf pine, 19.5 in. DBH, located 8 chains at 315° from the southeast corner of Stand 2.23.

2. Cavity in longleaf pine, 20 in. DBH, located 2 chains at 300° noted above.
3. Start in longleaf pine, 16.5 in. DBH, located 1 chain at 180° noted above.
4. Start in longleaf pine, 17.5 in. DBH, located 1 chain at 265° from the tree noted above.
5. Start in longleaf pine, 17 in. DBH, located 1 chain at 352° from the tree noted above.

4.6 PROTECTION OF CLUSTERS (HQDA ESMG: V.I.)

1. Markings.

All trees with cavities and cavity starts within the HMU have been marked in conformance with the latest guidance. All trees with artificial cavities and cavity starts will be marked in the same manner immediately after construction is completed. The boundaries of all existing clusters have been identified by the marking of buffer trees. Additional warning signs have been placed along Roads 26 and 27. Recruitment clusters will be marked in the same manner after the construction of the prescribed artificial cavities and starts.

2. Training and Other Activities within RCW clusters.

Guidelines and restrictions will be incorporated into Fort McDonald's training regulations, with provisions to make individuals in violation subject to punitive action under the Uniform Code of Military Justice. Violations are most likely to be observed by personnel of the Environmental and Natural Resources Management Division (ENRMD) or Range Division. The policy will be to report violations involving training to the installation range office and all other violations to the Game Enforcement Branch of the Provost Marshal Office for the initial investigation. The report of the violation will be turned over to the Military Police Investigations Branch for final dispensation. Violations of the ESA by civilians or off-duty military personnel will be processed through Federal magistrate court.

4.7 AUGMENTATION, TRANSLOCATION, RECRUITMENT, AND PERMITTING (HQDA ESMG: V.J.)

1. Augmentation.

Augmentation will be used in any single bird sites identified during monitoring activities described in Chapter 5 of this plan, depending upon the availability of suitable juveniles. Priority will be given to the augmentation of bachelor male groups. Adult RCWs will not be taken from their resident sites.

2. Translocation.

Translocation is not an appropriate technique for the Fort McDonald RCW population at this time. However, translocation may be considered in the future to establish new active clusters.

3. Recruitment.

Prescriptions for the development of two recruitment stands will be prepared in 1995 and implemented in 1996. Two additional sites will be provisioned each year until sufficient sites exist to meet the population goal of 14 clusters.

4. Permitting.

Permits for RCW capture and banding are on file with the Fish and Wildlife Branch, ENRMD. Permits for the translocation of juvenile females to bachelor male sites (augmentation) or juvenile males to appropriate sites will be sought upon approval of this ESMP.

4.8 AWARENESS TRAINING PROGRAM (AR 200-3: 11-10)

An education program is required for military personnel who may have contact with listed species or their habitats. Fort McDonald has an environmental compliance program that addresses all applicable aspects of environmental compliance. The environmental compliance program will be responsible for the development of a RCW awareness training program for military personnel at Fort McDonald. This training program will help ensure the success of RCW management on Fort McDonald and assist in avoiding ESA violations during training activities. The awareness training program will cover unit and individual responsibilities and liability under Federal law, the importance of protecting the RCW and any listed species, and balancing the accomplishment of the installation's mission with the conservation of the RCW and its critical habitat. The environmental compliance program will develop and issue to each battalion a manual that contains information on the identification of RCWs, markings used to identify cavity trees and buffer trees on Fort McDonald, activities that are prohibited because of potential injury to RCWs and/or their habitat, and the locations of known RCW cavity trees to assist in planning and executing field training activities.

5.0 SURVEYS, INSPECTIONS, AND MONITORING (AR 200-3: 11-5, 11-6; HQDA ESMG: V.C.)

The effectiveness of the implementation of this plan will be monitored by conducting RCW surveys within each cluster for activity and productivity. Recruitment stands will also be surveyed following the construction of the artificial cavities and starts. An accurate survey of all Fort McDonald land for RCW cavity and cavity-start trees will be made every 5 years beginning with approval of this plan. The survey will document the location of cavity and cavity-start trees (using GIS) and the activity within the clusters on Fort McDonald to determine whether conservation goals are being achieved. The 5-year installation-wide survey will be accomplished by conducting annual surveys covering one-fifth of the installation land area.

Annual inspections of habitat in identified clusters will be made to gain information needed to develop or modify treatments to maintain suitable nesting habitat. At a minimum, these features of nesting habitat will be inspected and recorded annually:

- (a) density and height of hardwoods around cavity and cavity-start trees;
- (b) height of RCW cavities;
- (c) condition of cavity trees and cavities (e.g., form and apparent health of trees and size of cavity opening);

APPENDIX A-EXAMPLE PLAN

- (d) a description of any damage to cavity trees from training activities, fire, etc;
- (e) evidence of RCW activity for each cavity tree within the cluster.

All records from surveys will be maintained permanently by the Fort McDonald Fish and Wildlife Branch. Maps depicting the location of RCW clusters will be prepared from survey data, made widely available to those conducting land-use activities on the installation, and updated every 5 years or when a 20% change in the number of clusters occurs, whichever is sooner. These maps will be incorporated into the installation's GIS database.

In addition to the 5-year population survey, a survey of the installation forests will be conducted every 10 years, as required. During the forest survey, information will be gathered to determine the quantity and quality of available foraging and nesting habitat for the RCW on Fort McDonald; a recognized plot sampling technique will be used for the forest survey.

An annual monitoring program will be conducted to determine demographic trends within the population at Fort McDonald. Since fewer than 25 clusters are present at Fort McDonald, all clusters will be monitored annually. The following information will be gathered in the monitoring program:

- (a) number of adults and fledglings per site;
- (b) sex of birds;
- (c) number of breeding groups; and
- (d) number of nests.

Color banding of birds will be performed to facilitate monitoring of demographic trends. The methodology for capture and banding of RCW will be developed and revised in consultation with the FWS. All records of monitoring RCW at Fort McDonald will be permanently maintained by the Fish and Wildlife Branch.

6.0 TIME, COSTS, AND PERSONNEL (AR 200-3: 11-5, 11-13)

The initial planning and funding period for the implementation of this ESMP is 5 years, though some components of the plan extend beyond this time frame. Projected annual costs for implementation are shown in Table 5, while Table 6 provides an estimate of required resources by proposed activity by year. Appropriate funding citations (P7, VENC, Legacy) should be made for each activity in Table 6.

7.0 CHECKLIST (AR 200-3: 11-5)

Refer to checklist matrix on pages 29-31.

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Table 5. Projected Annual Implementation Costs

| Fiscal Year | Estimated Annual Cost (\$ thousands) |
|----------------|--------------------------------------|
| 1995 | \$\$.\$\$ |
| 1996 | \$\$.\$\$ |
| 1997 | \$\$.\$\$ |
| 1998 | \$\$.\$\$ |
| 1999 | \$\$.\$\$ |
| 5-year Total * | \$\$.\$\$ |

*Total estimated cost for this plan is \$\$\$. \$\$ thousand dollars when activities scheduled for FY 2000 (\$\$. \$\$ thousand dollars) are included.

Table 6. Estimate of Required Resources by Activity by Year

| Fiscal Year | Activities | Personnel [many year requirements] (work-years) | Cost (\$\$/APC) | | | | Total |
|-------------|-------------------|--|---|-----------|------------------|----------|-------------|
| | | | Personnel (\$./P7) (\$./VENC) (\$./Legacy) | Materials | BCE Equipment | Contract | |
| FY 1995 | Fall 1994 | Provision RCW Cluster 1 with 2 artificial cavities | | | | | \$. \$ \$ |
| | Fall 1994 | Provision RCW Cluster 2 with 1 artificial cavity | | | | | \$. \$ \$ |
| | Fall 1994 | Provision RCW Cluster 4 with 2 artificial cavities and 3 starts | | | | | \$. \$ \$ |
| | Winter 1994/95 | Burn Stands 2.14, 2.16, and 2.23 IAW prescription (RCW 1) | | | | | \$. \$ \$ * |
| | Winter 1994/95 | Burn Stands 2.14, 2.16, and 3.14 IAW prescription (RCW 2) | | | | | \$. \$ \$ |
| | Winter 1994/95 | Burn Stands 2.18 and 2.23 IAW prescription (RCW 4) | | | | | \$. \$ \$ |
| | Spring 1995 | Thin/patch cut Stand 3.14 IAW prescription (RCW 2) | | | | | \$. \$ \$ |

Table 6 (continued)

| Fiscal Year | Activities | Personnel [many year requirements] (work-years) | Cost (\$\$\$/APC) | | | | Total |
|----------------|--|--|---|-----------|------------------|----------|---------|
| | | | Personnel (\$.\$\$/P7) (\$.\$\$/VENC) (\$.\$\$/Legacy) | Materials | BCE Equipment | Contract | |
| Spring 1995 | Thin Stand 2.15 to an average basal area of 60 sq. ft per acre to allow natural regeneration, favoring longleaf, slash, and loblolly, in that order | | | | | | \$.\$\$ |
| Summer 1995 | Monitor effectiveness of plan by conducting RCW surveys for activity and productivity | | | | | | \$.\$\$ |
| Summer 1995 | Report to Commander on effectiveness of ESMP | | | | | | \$.\$\$ |
| FY 1996 | Burn Stands 2.15, 2.17, 2.19, 2.20, and 2.21 IAW prescription (RCW 1) | | | | | | \$.\$\$ |

Table 6 (continued)

| Fiscal Year | Activities | Personnel [many year requirements] (work-years) | Cost (\$\$\$/APC) | | | | Total |
|-------------------|---|--|---|-----------|------------------|----------|----------|
| | | | Personnel (\$.\$\$/P7) (\$.\$\$/VENC) (\$.\$\$/Legacy) | Materials | BCE Equipment | Contract | |
| Winter 1995/96 | Burn Stand 2.22 IAW prescription (RCW 2) | | | | | | \$.\$ \$ |
| Winter 1995/96 | Burn Stands 3.10, 3.11, 3.12, and 3.13 IAW prescription (RCW 4) | | | | | | \$.\$ \$ |
| Winter 1995/96 | Hand-plant containerized longleaf pine seedlings in patch cuts in Stand 3.14 | | | | | | \$.\$ \$ |
| Summer 1996 | Monitor effectiveness of plan by conducting RCW surveys for activity and productivity | | | | | | \$.\$ \$ |
| Summer 1996 | Report to Commander on effectiveness of ESMP | | | | | | \$.\$ \$ |

Table 6 (continued)

| Fiscal Year | Activities | Personnel [many year requirements] (work-years) | Cost (\$\$/APC) | | | | Total |
|-------------|----------------|---|--|-----------|------------------|----------|-------------|
| | | | Personnel (\$./\$/P7) (\$./\$/VENC) (\$./\$/Legacy) | Materials | BCE Equipment | Contract | |
| FY 1997 | Winter 1996/97 | Burn Stands 3.10, 3.11, 3.12, 3.13, and 3.15 IAW prescription (RCW 2) | | | | | \$. \$ \$ |
| | Winter 1996/97 | Burn Stands 2.19, 2.20, and 2.21 IAW prescription (RCW 3) | | | | | \$. \$ \$ * |
| | Winter 1996/97 | Burn Stand 2.19 IAW prescription (RCW 4) | | | | | \$. \$ \$ |
| | Summer 1997 | Monitor effectiveness of plan by conducting RCW surveys for activity and productivity | | | | | \$. \$ \$ |
| | Summer 1997 | Report to Commander on effectiveness of ESMP | | | | | \$. \$ \$ |

Table 6 (continued)

| Fiscal Year | | Activities | Personnel [manyear requirements] (work-years) | Cost (\$\$/APC) | | | | Total |
|-------------|----------------|---|--|--|-----------|------------------|----------|-----------|
| | | | | Personnel (\$./\$/P7) (\$./\$/VENC) (\$./\$/Legacy) | Materials | BCE Equipment | Contract | |
| FY 1998 | Winter 1997/98 | Burn Stands 2.14, 2.16, and 2.23 IAW prescription (RCW 1) | | | | | | \$. \$ \$ |
| | Winter 1997/98 | Burn Stands 2.14, 2.16, and 3.14 IAW prescription (RCW 2) | | | | | | \$. \$ \$ |
| | Winter 1997/98 | Burn Stands 2.18 and 2.23 IAW prescription (RCW 4) | | | | | | \$. \$ \$ |
| | Summer 1998 | Monitor effectiveness of plan by conducting RCW surveys for activity and productivity | | | | | | \$. \$ \$ |
| | Summer 1998 | Report to Commander on effectiveness of ESMP | | | | | | \$. \$ \$ |

Table 6 (continued)

| Fiscal Year | Activities | Personnel (manyear requirements) (work-years) | Cost (\$\$/APC) | | | | Total |
|-------------|-------------------|---|--|-----------|------------------|----------|-------|
| | | | Personnel (\$\$/P7) (\$\$/VENC) (\$\$/Legacy) | Materials | BCE Equipment | Contract | |
| FY 1999 | Winter 1998/99 | Burn Stands 2.15, 2.17, 2.19, 2.20, 2.21 IAW prescription (RCW 1) | | | | | \$. |
| | Winter 1998/99 | Burn Stand 2.22 IAW prescription (RCW 2) | | | | | \$. |
| | Winter 1998/99 | Burn Stands 3.10, 3.11, 3.12, and 3.13 IAW prescription (RCW 4) | | | | | \$. |
| | Spring 1999 | Burn stands 2.14, 2.16, 2.18, and 2.23 IAW prescription (RCW 1) | | | | | \$. |
| | Summer 1999 | Monitor effectiveness of plan by conducting RCW surveys for activity and productivity | | | | | \$. |

Table 6 (continued)

| Fiscal Year | Activities | Personnel [many year requirements] (work-years) | Cost (\$\$\$/APC) | | | | Total |
|-------------|-------------------------|---|---|-----------|------------------|----------|--------|
| | | | Personnel (\$ \$\$/P7) (\$ \$\$/VENC) (\$ \$\$/Legacy) | Materials | BCE Equipment | Contract | |
| | Summer 1999 | Report to Commander on effectiveness of ESMP | | | | | \$.\$. |
| | Summer 1999 | Major revision of ESMP | | | | | \$.\$. |
| FY 2000 | Winter 1999- 2000 | Burn Stands 3.10, 3.11, 3.12, 3.13, and 3.15 IAW prescription (RCW 2) | | | | | \$.\$. |
| | Winter 1999- 2000 | Burn Stands 2.19, 2.20, and 2.21 IAW prescription (RCW 3) | | | | | \$.\$. |
| | Winter 1999- 2000 | Burn Stand 2.19 IAW prescription (RCW 4) | | | | | \$.\$. |
| | Summer 2000 | Monitor effectiveness of plan by conducting RCW surveys for activity and productivity | | | | | \$.\$. |

Table 6 (continued)

| Fiscal Year | Activities | Personnel [many year requirements] (work-years) | Cost (\$\$/APC) | | | | Total |
|----------------|---|--|--|-----------|------------------|----------|-----------|
| | | | Personnel (\$./\$/P7) (\$./\$/VENC) (\$./\$/Legacy) | Materials | BCE Equipment | Contract | |
| Summer 2000 | Report to Commander on effectiveness of ESMP | | | | | | \$. \$ \$ |

7.0 CHECKLIST

| Schedule | Activity | Implemented | |
|----------------|--|-------------|-----------|
| | | Date | Signature |
| Fall 1994 | Provision RCW Cluster 1 with 2 artificial cavities | | |
| Fall 1994 | Provision RCW Cluster 2 with 1 artificial cavity | | |
| Fall 1994 | Provision RCW Cluster 4 with 2 artificial cavities and 3 starts | | |
| Winter 1994/95 | Burn Stand 2.14, 2.16, and 2.23 IAW burn prescription (RCW 1) | | |
| Winter 1994/95 | Burn Stands 2.14, 2.16, and 3.14 IAW burn prescription (RCW 2) | | |
| Winter 1994/95 | Burn Stands 2.18 and 2.23 IAW prescription (RCW 4) | | |
| Spring 1995 | Thin/patch cut Stand 3.14 IAW prescription (RCW 2) | | |
| Spring 1995 | Thin Stand 2.15 to an average basal area of 60 sq. ft. per acre to allow natural regeneration, favoring longleaf, slash, and loblolly, in that order | | |
| Summer 1995 | Monitor effectiveness of plan by conducting RCW surveys for activity and productivity | | |
| Summer 1995 | Report to Commander on effectiveness of ESMP | | |
| Winter 1995/96 | Burn Stands 2.15, 2.17, 2.19, 2.20, 2.21 IAW burn prescription (RCW 1) | | |
| Winter 1995/96 | Burn Stand 2.22 IAW prescription (RCW 2) | | |
| Winter 1995/96 | Burn Stands 3.10, 3.11, 3.12, and 3.13 IAW prescription (RCW 4) | | |
| Winter 1995/96 | Hand-plant containerized longleaf pine seedlings in patch cuts in Stand 3.14 | | |
| Summer 1996 | Monitor effectiveness of plan by conducting RCW surveys for activity and productivity | | |

CHECKLIST (continued)

| Schedule | Activity | Implemented | |
|------------------|---|-------------|-----------|
| | | Date | Signature |
| Summer 1996 | Report to Commander on effectiveness of ESMP | | |
| Winter 1996/97 | Burn Stands 3.10, 3.11, 3.12, 3.13, and 3.15 IAW prescription (RCW 2) | | |
| Winter 1996/97 | Burn Stands 2.19, 2.20, and 2.21 IAW prescription (RCW 3) | | |
| Winter 1996/97 | Burn Stand 2.19 IAW prescription (RCW 4) | | |
| Summer 1997 | Monitor effectiveness of plan by conducting RCW surveys for activity and productivity | | |
| Summer 1997 | Report to Commander on effectiveness of ESMP | | |
| Winter 1997/98 | Burn Stands 2.14, 2.16, and 2.23 IAW burn prescription (RCW 1) | | |
| Winter 1997/98 | Burn Stands 2.14, 2.16, and 3.14 IAW prescription (RCW 2) | | |
| Winter 1997/98 | Burn Stands 2.18 and 2.23 IAW prescription (RCW 4) | | |
| Summer 1998 | Monitor effectiveness of plan by conducting RCW surveys for activity and productivity | | |
| Summer 1998 | Report to Commander on effectiveness of ESMP | | |
| Winter 1998/99 | Burn Stands 2.15, 2.17, 2.19, 2.20, 2.21 IAW burn prescription (RCW 1) | | |
| Winter 1998/99 | Burn Stand 2.22 IAW prescription (RCW 2) | | |
| Winter 1998/99 | Burn Stands 3.10, 3.11, 3.12, and 3.13 IAW prescription (RCW 4) | | |
| Spring 1999/2000 | Burn Stands 2.14, 2.16, 2.18, and 2.23 IAW burn prescription (RCW 1) | | |
| Summer 1999 | Monitor effectiveness of plan by conducting RCW surveys for activity and productivity | | |

CHECKLIST (continued)

| Schedule | Activity | Implemented | |
|------------------|---|-------------|-----------|
| | | Date | Signature |
| Summer 1999 | Report to Commander on effectiveness of ESMP | | |
| Summer 1999 | Major revision of ESMP | | |
| Winter 1999/2000 | Burn Stands 3.10, 3.11, 3.12, 3.13, and 3.15 IAW prescription (RCW 2) | | |
| Winter 1999/2000 | Burn Stands 2.19, 2.20, and 2.21 IAW prescription (RCW 3) | | |
| Winter 1999/2000 | Burn Stand 2.19 IAW prescription (RCW 4) | | |
| Summer 2000 | Monitor effectiveness of plan by conducting RCW surveys for activity and productivity | | |
| Summer 2000 | Report to Commander on effectiveness of ESMP | | |

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Exhibit A

Glossary

Augmentation - Relocation of an RCW, normally a juvenile/fledgling female, from one active cluster to another active cluster.

Basal area (BA) - The cross-sectional area (square feet) of trees per acre measured at approximately four and one-half feet from the ground.

Biological diversity - The variety of life and its processes. It includes the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur.

Buffer zone - The zone extending outward 200 ft from the outermost cavity trees in a cluster.

Cavity - An excavation in a tree made, or artificially created, for roosting and nesting by RCWs.

Cavity restrictor - A metal plate that is placed around an RCW cavity to prevent access by larger species. A restrictor also prevents a cavity from being enlarged, or if already enlarged, shrinks the cavity entrance diameter to a size that prevents access by larger competing species.

Cavity start - An incomplete cavity excavated by, or artificially created for, RCWs.

Cavity tree - A tree containing one or more active or inactive RCW cavities or cavity starts.

Cluster - The aggregate area encompassing cavity trees occupied or formerly occupied by an RCW group plus a 200-ft buffer zone (formerly called "colony").

Effective breeding pairs - Groups that successfully fledge young.

Group - A social unit of one or more RCWs that inhabits a cluster (formerly called "clan"). A group may include a solitary, territorial male; a mated pair; or a pair with helpers (offspring from previous years).

Habitat Management Unit (HMU) - Designated area(s) managed for RCW nesting and foraging, including clusters and areas determined to be appropriate for recruitment and replacement stands.

Impact/danger areas - The ground within the training complex used to contain fired or launched ammunition or explosives and the resulting fragments, debris, and components from various weapons systems.

Population - An RCW population is the aggregate of groups which are close enough together so that the dispersal of individuals maintains genetic diversity and all the groups are capable of genetic interchange. Population delineations should be made irrespective of land ownership.

Provisioning - The artificial construction of cavities or cavity starts.

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Recovery population - A total of 250 or more effective breeding pairs annually.

Recruitment - The designation and management of habitat for the purpose of attracting a new breeding group to that habitat.

Recruitment stand - A stand of trees, minimum of 10 acres in size, with sufficient suitable RCW nesting habitat identified to support a new RCW cluster group. Stand and supporting foraging area should be located 3/8 to 3/4 mile from a cluster or other recruitment stand.

Relict tree - A pine tree usually more than 100 years old having characteristics making it attractive to the RCW for cavity excavation.

Replacement stand - A stand of trees, minimum of 10 acres in size, identified to provide suitable nesting habitat for colonization when the current cluster becomes unsuitable. The stand should be approximately 20-30 years younger than the active cluster. While it is preferable for replacement stands to be contiguous to the active colony, at no time should they be more than 1/4 mile from the cluster, unless that is no suitable alternative.

Stand - An aggregation of trees occupying a specific area and sufficiently uniform in species composition, age, arrangement, and condition so as to be distinguishable from the forest on adjoining areas.

Sub-population - The aggregate of groups which are close enough together to allow for demographic interchange between groups. A sub-population does not have a significant demographic influence on adjacent sub-population, but there is sufficient genetic interchange between the sub-populations to be considered one population.

Translocation - The relocation of one or more RCWs from an active cluster to an inactive cluster or recruitment stand that contains artificially constructed cavities.

Exhibit B

Individuals and Organizations Contributing to the Plan

1.0 Fort McDonald ESMP Team

Frank B. Adams, Endangered Species Biologist, Fish and Wildlife Branch, Environmental and Natural Resources Management Division (ENRMD)

Steve Cramer, Chief, Forestry Branch, ENRMD

Gary Leydorf, Environmental Law Specialist, Staff Judge Advocate

Col. Steve Milazzo, Installation Engineer, Directorate of Engineering and Housing

Kathy Mitz, Chief, ENRMD

Donna Seaver, Range Officer, Directorate of Training

2.0 Individuals Contacted

| Name | Affiliation and Address | Telephone |
|----------------|--|----------------|
| Ross Pergler | U.S. Fish and Wildlife Service 19 Riverbrook Road Sumter, SC 31323 | (803) 323-7356 |
| Rick Abston | U.S. Fish and Wildlife Service 75 Spring Street Atlanta, GA 30303 | (404) 823-7239 |
| Susan Arnseth | U.S. Forest Service 1720 Peachtree Road, NW Columbia, SC 30367 | (803) 823-9361 |
| Michael Bahl | Department of Zoology Clemson University Sumter, SC 30602 | (803) 621-3782 |
| Mark Deacon | South Carolina Dept. of Natural Resources Game and Fish Division 205 Butler Street, SE Columbia, SC 30334 | (803) 993-3521 |
| Charles Groton | South Carolina Forestry Commission Box 819 Columbia, SC 31298-4599 | (803) 993-3835 |
| Stanley Newby | Wildlife Resources, Inc. 1007 Bond Drive Florence, SC 37932 | (803) 888-2695 |

3.0 Cooperating Agencies

South Carolina Forestry Commission
Box 819
Columbia, SC 31298-4599

4.0 Cooperative Agreements

Cooperative agreements are being negotiated among Fort McDonald, the FWS, McDonald State Forest, and Jackson Timber Company. These agreements will focus on the establishment and management of a habitat corridor across land owned by Jackson Timber Company. This 1.6-mile-long habitat corridor would link the installation's RCW population with the larger population in McDonald State Forest. This RCW population, approximately 5 miles to the southwest, is composed of 30 active clusters and 10 inactive clusters.

5.0 Coordination and Consultation

Fort McDonald will enter into formal consultation with the FWS regarding the on-going mission at the installation. Consultation between the Department of the Army (DA) and the FWS is planned to develop new guidelines for RCW management on all Army lands. This ESMP will be modified as necessary to comply with final guidelines developed during this consultation.

Exhibit C
Management Prescriptions

Thinning Prescription for Stand 2.15 (Cluster 1)

Stand History: This is a natural longleaf stand with evidence of naval stores operations (catfaces) and cattle grazing (historical accounts and presence of a dipping vat nearby). It is likely that a growing season fire was a common, perhaps annual event, probably occurring most often in the early spring. The shift to winter fires and the increase fire return interval during the last 50 years have allowed slash and loblolly pines to become established on the longleaf sites. Wiregrass still dominates the groundcover, and the native fire-adapted herbaceous plant community appears to be largely intact. The last timber cut was a thinning in 1978 and the last burn was performed in 1990.

Stand Description (Source— 1992 Forest Inventory):

| | |
|--|---|
| Species | Longleaf pine (<i>Pinus palustris</i>) |
| Average pine BA | 80 sq. ft/acre |
| Average pine DBH | 10 in. (range 7–23 in.) |
| Total pine stems | 10,102 |
| Total pine stems (10" or greater DBH) | 6678 (2/3 of 10,102) |
| Understory height | 3 ft |
| Average hardwood BA | Less than 10 sq. ft/acre |
| Average fire interval | 4.5 years |
| Soil type | Mascotte |
| Topography | Flat |
| Size | 69 acres |
| Average age | 40 years (range 1–120) |
| RCW | Stand contributes 5520 sq ft of basal area and 6678 pine stems greater than 10 in. DBH to the foraging resources of RCW Cluster #1. |

Desired Future Condition: Uneven-aged longleaf pine, with small even-aged patches of varying size.

Limitations: Residual stand must provide at least 3000 stems 10 in. or greater DBH after treatment to maintain a surplus of foraging resources for RCW Cluster 1.

Treatment: Thin existing stand to an average basal of 60 sq. ft per acre. Release existing natural seedlings where they exist to create small areas of regeneration (1/4 to 5 acres in size) distributed throughout the stand. If no such regeneration exists, regeneration should be encouraged by reducing overstory to 30 to 40 sq. ft BA area (shelterwood) in small patches (0.25 to 5 acres), distributed throughout the stand. In either case, the total regeneration area should be approximately 10% of stand total (6.9 acres). Thinning should favor the larger trees (except in regeneration areas) and should favor longleaf, slash, and loblolly, in that order.

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Prescription for Conversion of Stand 3.14 to Longleaf Pine (Cluster 2)

Stand History: Slash pine plantation, roller chopped, bedded, and planted in 1964, 8 x 8 foot spacing. Thinned to 80 sq. ft per acre average BA in 1985. Winter burned at 1-to 2-year intervals since construction of MPRC in 1983. Wildfires are frequent within this stand.

Stand Description (from 1992 Forest Inventory)

| | |
|-----------------------|---|
| Species | Slash pine (<i>Pinus elliottii</i>) |
| Average pine BA | 100 sq. ft. per acre |
| Average pine DBH | 10 in. (range 7-13 in.) |
| Total pine stems | 7699 |
| Understory height | Less than 3 ft |
| Average hardwood BA | Less than 10 sq. ft per acre. |
| Average fire interval | 1.5 years |
| Soil type | Leefield |
| Topography | Flat |
| Size | 42 acres |
| RCW | Stand contributes 4200 sq. ft of basal area and 5081 pine stems greater than 10 in. DBH to the foraging resources of RCW Cluster 2. |

Desired Future Condition: Uneven-aged longleaf pine, with small even-aged patches of varying size. Should be achieved incrementally by first establishing a seed source and then maintaining the stand in a condition conducive to natural regeneration of longleaf pine. This will require a prescribed fire at an interval of no more than 3 years, with burns normally being conducted during the growing season.

Limitations: Residual stand must provide at least 2300 sq. ft of BA and 2813 stems 10 in. or greater DBH after treatment to maintain foraging resources for RCW Cluster 2.

| | | |
|-------------|----------------|---|
| Treatments: | Winter 1994-95 | Burn IAW burn prescription (Appendix C). |
| | Spring 1995 | Clearcut approximately 50 small patches, 0.1 acre in size (1 chain x 1 chain) evenly distributed throughout the stand on a 3-chain by 3-chain grid (center to center), and thin remainder of stand to an average density of 70 sq. ft per acre. |
| | Winter 1995-96 | Plant 43 containerized longleaf pine seedlings on a 10 ft x 10 ft spacing in each of the approximately 50 0.1 acre patch cuts. |

Burn Prescription for Stands 2.14, 2.16, 2.18, and 2.23

These stands consist of 213 acres. They have been consolidated because the same burn prescription will be applied to all of them, however, it is advisable to burn stands 2.14 and 2.16 at separate times during the growing season. Weather is less predictable during the growing season and it is desirable to limit burns to 100 acres or less. You can burn one stand (or two, as acreage dictates), allow time for green-up, and then burn another. Ground fuel is low in all stands and most hardwoods are already stressed from previous winter burns.

Goal — This is the initial growing season burn for all of the aforementioned stands. It will be followed up by a winter, aerial ignition burn in two years, and then burn prescriptions will be revised according to the needs of individual stands or stand groups.

Boundaries/Interior Breaks — Road 26 forms the northwest boundary for stand 2.14. On the North, East, and South side it has a 16' wide break, which may or may not be planted at the time of the burn. This wide break borders an oak stand (Stand 2.24) where fire is excluded. The break on the opposite side of the exclusion forms the western boundary of Stand 2.16. A woods trail forms the northern and eastern boundaries of stand 2.16 and a firebreak forms the southern boundary. Stands 2.18 and 2.23 may be burned as one unit. They have a woods trail on their western side, a firebreak on the southern side of Stand 2.23, Road 27 on the East side, and a firebreak on the North side.

Prescribed Burn Parameters

- Wind Speed — 1-5 M.P.H.
- Time of Day — Morning, or as soon as it will burn.
- Season of Burn — Late Spring (May or June).
- Wind Direction — Any direction.
- Fuel Moisture — 10% or greater.
- Relative Humidity — Above 30% at the time of ignition.
- Temperature — Below 90° F.

Firing Technique — GRID IGNITION: If fire becomes too intense as fuel dries out, try widening lines and spots. If fire is still too intense, let spots burn together, and let the remainder settle into a backing fire, or plow it out and attempt burn again when weather conditions improve.

Precautions — Be certain to have ample personnel available to execute the burn. Heat stress is a possibility and needs to be taken into consideration. Be certain that adequate soil moisture is present at time of ignition.

TOTAL ESTIMATED COST OF LABOR AND EQUIPMENT (213 Acres @ \$/acre) = \$\$\$\$

Burn Prescription for Stands 2.15, 2.17, 2.19, 2.20, 2.21, 2.25, and 2.26

These stands, with the exception of stands 2.25 and 2.26, are natural pine with longleaf pine (*Pinus palustris*) being the major upland species, and slash pine (*P. elliotii*) and pond pine (*P. serotina*) occurring in and adjacent to the wetland. Stands 2.25 and 2.26 are oak stands and will be treated as exclusions from the burn. The entire area, less exclusions, is 452 acres. It was last burned in the winter of 1992/1993. Ground fuel consists of wiregrass, saw palmetto, and gallberry on the upland areas, and *Lyonia spp.*, and titi (*Cliftonia monophylla*) along the wetland edges. Post oak (*Quercus stellata*), water oak (*Q. nigra*), and red maple (*Acer rubrum*) are scattered randomly throughout the majority of the stands.

Goal — The major objective of this burn is to reduce ground fuel to an acceptable level and prepare this stand for a future growing season burn regime. See remarks under "Goal" in burn prescription for stand 2.24 for treatment of the exclusions (Stands 2.25 and 2.26).

Boundaries/Interior Breaks — Wetlands formed by a "hardwood creek bottom" from the southern boundary. A firebreak forms the northern boundary and a combination of Road 27 and a firebreak from the eastern boundary. There is a woods trail on the western side which can be graded, yoke, or wet down just prior to ignition.

Prescribed Burn Parameters

- Wind Speed — 1-3 M.P.H., in stand.
- Time of Day — Morning, or as soon as it will burn.
- Season of Burn — Winter
- Wind Direction — Any direction.
- Fuel Moisture — 18% or greater.
- Relative Humidity — Above 50% at time of ignition.
- Temperature — Below 50° F.

Firing Technique — Aerial ignition, using Delayed Aerial Ignition Device (DAID), with a 1 × 1 chain grid. This grid pattern may be increased (maximum 4 × 4 grid) as needed throughout the morning as fuels dry out.

Precautions — When establishing the perimeter breaks for stands 2.25 and 2.26, keep the break *outside* of the dripline of the oaks that are being excluded from the burn. Be certain that adequate soil moisture is present at time of ignition.

Just prior to aerial ignition, ground personnel should light the *outside* perimeter of stands 2.25 and 2.26. As *soon* as that person is clear of the burn, have the chopper ignite the remaining immediate area around the exclusions. This step should closely *follow* the lighting of the baseline. The reason for encircling the excluded stands is to make them visible to the chopper pilot. If the wetland is used as the baseline, plan burn at a time when that area is wet enough to prevent fire from carrying across it. If this is the case, the baseline can be ignited aurally.

APPENDIX A-EXAMPLE PLAN

Burn Prescription for Stands 2.15, 2.17, 2.19, 2.20, 2.21, 2.25, and 2.26 (continued)

| | | |
|-----------------------------------|--------------------------|------------|
| Estimated Labor — | ___ Mandays Preparation | |
| | ___ Mandays Execution | |
| TOTAL: | ___ Mandays at a cost of | \$\$\$ |
| Estimated Equipment Cost — | Tractor | \$\$\$ |
| | Helicopter | \$\$\$ |
| | TOTAL: | \$\$\$ |
| TOTAL COST OF LABOR AND EQUIPMENT | | \$\$\$\$\$ |

Burn Prescription for Stand 2.22

This is a natural stand consisting of a mixture of old growth longleaf pine (*Pinus palustris*) and a few scattered mature slash pine (*Pinus elliottii*). Regeneration consists of longleaf of various age classes, from the grass stage up to 14" D.B.H., and young slash 2 to 6 feet tall. There are no wetlands of accountable size. At the present time this is a six year rough since last burn. There is already substantial wiregrass scattered throughout the stand, mixed unequally with saw palmetto and several species of *Vaccinum*.

Goal — The major objective of this burn is to reduce the fuel load and prepare this stand for a future growing season burn regime.

Prescribed Burn Parameters

- Wind Speed — 1-3 M.P.H. optimum, but up to 10 M.P.H. is acceptable, as long as the direction is steady and care is taken when lighting the lines to ensure against jumps.
- Time of Day — Morning, or as soon as it will burn
- Season of Burn — Winter
- Wind Direction — North or south, with no more than a predicted 30 degree variance. It is imperative that this burn is not conducted at a time except when wind direction is fairly predictable, such as, before or after the passing of a weather front.
- Fuel Moisture — 10 to 20%.
- Relative Humidity — 40 to 55%
- Temperature — Below 60° F.

Boundaries and Crossbreaks — This stand is bordered by a road on the North, East, and West, with a firebreak as the southern boundary. There is also one East-West cross break intersecting the stand.

Precautions — All RCW trees should be mowed/raked just prior to burn. Soil moisture should be fairly high when conducting this burn.

Firing Technique — BACKFIRE: Upon completion, this burn needs to be evaluated. The decision of whether another fuel reduction burn is necessary or not before the growing season needs to be made just prior to the next burn.

| | | |
|-----------------------------------|--------------------------|------------|
| Estimated Labor — | ___ Mandays Preparation | |
| | ___ Mandays Execution | |
| TOTAL: | ___ Mandays at a cost of | \$\$\$ |
| Estimated Equipment Cost — | | \$\$\$ |
| TOTAL COST OF LABOR AND EQUIPMENT | | \$\$\$\$\$ |

Burn Prescription for Stand 3.10

This stand consists of a 69 acre, 20-year-old, loblolly pine (*Pinus taeda*) plantation. An old field occupied this site up until the 1940s. It was last burned in the winter of 1990/1991. This was the initial fuel reduction burn, executed on a marginal day, with results showing coverage to be spotty. There are no wetlands in this stand.

Goal — The major objective of this burn is to reduce the fuel load. This site is scheduled for a thinning, after which, the burn prescription will be revised.

Prescribed Burn Parameters

- Wind Speed — 1-3 M.P.H. optimum, but up to 10 M.P.H. is acceptable as long as the direction is steady and care is taken when lighting the lines to ensure against jumps.
- Time of Day — Morning, or as soon as it will burn
- Season of Burn — Winter
- Wind Direction — North or South, with no more than a predicted 30 degree variance. It is imperative that this burn is not conducted except at a time when wind direction is fairly predictable, such as before or after the passing of a weather front.
- Fuel Moisture — 10 to 20%.
- Relative Humidity — 40 to 55%.
- Temperature — Below 60° F.

Boundaries and Crossbreaks — This stand is bordered by Road 27 on the West side, and firebreaks on the remaining North, East, and South sides. There are two existing interior crossbreaks that need to be harrowed down before the burn is initiated.

Precautions — Adequate soil moisture should be present to keep fire stress to a minimum.

Firing Technique — BACKFIRE: The last time this stand was burned, portions of it burned spotty, therefore, fuel load is still heavy in some areas. Until this stand is thinned, the canopy will remain very nearly closed. In a case like this, greater wind speeds can sometimes be advantageous, however, extra care may need to be taken when lighting the baseline to prevent jumps from crossing it.

| | | |
|-----------------------------------|-------------------------|------------|
| Estimated Labor — | __ Mandays Preparation | |
| | __ Mandays Execution | |
| TOTAL: | __ Mandays at a cost of | \$\$\$ |
| Estimated Equipment Cost — | | \$\$\$ |
| TOTAL COST OF LABOR AND EQUIPMENT | | \$\$\$\$\$ |

APPENDIX A-EXAMPLE PLAN

Burn Prescription for Stand 3.11

This is a 59 acre stand consisting of 30-year-old planted pine (*Pinus elliottii*), last burned in the winter of 1992/1993. Trees were thinned in 1985, and the overall vigor of the stand is good.

Goal — The major objective of this burn is to prepare this site for a growing season burn regime.

Prescribed Burn Parameters

GRID IGNITION TECHNIQUE:

- Wind Speed — 1-3 M.P.H. in stand.
- Time of Day — Morning, or as soon as it will burn.
- Season of Burn — Winter.
- Wind Direction — Any direction.
- Fuel Moisture — 10% or greater.
- Relative Humidity — 30 to 55%.
- Temperature — Below 60° F.

BACKFIRE TECHNIQUE:

- Wind Speed — 1 to 10 M.P.H.
- Time of Day — Morning, or as soon as it will burn.
- Season of Burn — Winter.
- Wind Direction — North or South.
- Fuel Moisture — 10 to 20%.
- Relative Humidity — 30 to 55%.
- Temperature — Below 70° F.

Boundaries and Crossbreaks — Road 27 forms the NW/SW boundary of the stand, with firebreaks forming the northern and eastern boundaries.

Precautions — Adequate soil moisture should be present when conducting this burn.

Firing Technique — GRID IGNITION: Initiate this burn with the grid ignition technique at two chain intervals between lines and spots. If fire begins to burn too hot as fuel moisture and relative humidity drop, be prepared to switch over to backfire technique.

| | | |
|-------------------|--------------------------|--------|
| Estimated Labor — | ___ Mandays Preparation | |
| | ___ Mandays Execution | |
| TOTAL: | ___ Mandays at a cost of | \$\$\$ |

| | |
|----------------------------|--------|
| Estimated Equipment Cost — | \$\$\$ |
|----------------------------|--------|

| | |
|-----------------------------------|------------|
| TOTAL COST OF LABOR AND EQUIPMENT | \$\$\$\$\$ |
|-----------------------------------|------------|

Burn Prescription for Stand 3.12

This stand consists of 32 acres of 15-year-old longleaf pine (*Pinus palustris*). It has been burned once in the last five years. Fuel consists of mostly straw and leaf litter, with some scattered tufts of wiregrass and gallberries 2- to 3-feet high. In places, fuel is somewhat stacked.

Goal — The major objective is to keep ground fuel in check, and to prepare stand for a growing season burn regime.

Prescribed Burn Parameters

- Wind Speed — 1-3 M.P.H.
- Time of Day — As soon as it will burn.
- Season of Burn — Winter.
- Wind Direction — North to South.
- Fuel Moisture — 15% or greater.
- Relative Humidity — 30 to 75%.
- Temperature — Below 60° F. Preferably colder.

Boundaries and Crossbreaks — This stand is bordered by Road 27 on the West side, and firebreaks on the North, East, and South side. There are no interior crossbreaks.

Precautions — Care should be taken not to initiate this burn when conditions are too dry. An optimum burn day for this stand would be when it is cloudy and cold.

Firing Technique — GRID IGNITION: Begin with a 2 chain x 2 chain grid. As fuel dries out later in the day, or if fire behavior warrants, spacing between spots can be widened to three or four chains if necessary, while keeping line spacing at two chains. If fire is still too intense after doubling the spacing between spits, allow the spits to burn into a backing fire, provided that wind direction is steady.

| | | |
|-----------------------------------|--------------------------|----------|
| Estimated Labor — | ___ Mandays Preparation | |
| | ___ Mandays Execution | |
| TOTAL: | ___ Mandays at a cost of | \$\$\$ |
| Estimated Equipment Cost — | | \$\$\$ |
| TOTAL COST OF LABOR AND EQUIPMENT | | \$\$\$\$ |

APPENDIX A-EXAMPLE PLAN

Burn Prescription for Stand 3.13

This is a fully stocked stand of 10-year-old planted pine (*Pinus elliottii*) that has never been burned. Fuel is stacked, but with careful prescription, it can be burned with relatively low loss of stocking. There are no wetlands present. Growth is slowing somewhat, due to encroaching sweetgums and oaks. It is 40 acres in size.

Goal — Although this stand is young, it needs burning in order to control hardwood competition while they are still at a size vulnerable to fire.

Prescribed Burn Parameters

- Wind Speed — 1-3 M.P.H., with no more than 5 M.P.H.
- Time of Day — Morning, if overcast skies are predicted; otherwise, early evening ignition for night burn.
- Season of Burn — Early Winter.
- Wind Direction — North.
- Fuel Moisture — 15% or greater.
- Relative Humidity — 50% or greater.
- Temperature — degrees or less.

Boundaries and Crossbreaks — Road on West side, all other sides bordered by firebreaks.

Precautions — It is imperative that this burn take place before the first killing frost, before the fuels reach a cured herbaceous stage. This helps to reduce heat intensity. If money and equipment permit, areas between rows could be mowed with a tractor/bush hog to help stagger fuel height. Also, soil moisture should be fairly high (preferably 1 to 2 days since last rain).

Firing Technique — BACKFIRE.

| | | |
|-----------------------------------|------------------------|----------|
| Estimated Labor — | — Mandays Preparation | |
| | — Mandays Execution | |
| TOTAL: | — Mandays at a cost of | \$\$\$ |
| Estimated Equipment Cost — | | \$\$\$ |
| TOTAL COST OF LABOR AND EQUIPMENT | | \$\$\$\$ |

Burn Prescription for Stand 3.14

This is a 42-acre stand consisting of 30-year-old planted pine (*Pinus elliottii*), last burned in the winter of 1992/1993. Trees were thinned in 1985, so crowns are relatively large for their age.

Goal — The major objective is to keep ground fuel in check, prior to upcoming silvicultural treatments. The stand location, adjacent to the MPRC, also warrants this due to frequent wildfires.

Prescribed Burn Parameters

BACKFIRE TECHNIQUE:

- Wind Speed — 1-10 M.P.H.
- Time of Day — As soon as it will burn.
- Season of Burn — Winter or early spring.
- Wind Direction — North.
- Fuel Moisture — 10 to 20%.
- Relative Humidity — 30 to 55%
- Temperature — Below 70° F.

GRID IGNITION TECHNIQUE:

- Wind Speed — 1-3 M.P.H in stand.
- Time of Day — As soon as it will burn.
- Season of Burn — Winter.
- Wind Direction — Any direction.
- Fuel Moisture — Above 12%.
- Relative Humidity — 30 to 55%
- Temperature — Below 60° F.

Boundaries and Crossbreaks — Roads 26 & 27 form the stand boundary on the West side. Firebreaks form the remaining boundaries. There is one existing E/W crossbreak that should be freshened up with a re-work harrow and used as an interior fireline in order to shorten burnout time if the backfire ignition technique is used.

Precautions — Adequate soil moisture should be present in order to help keep fire stress to a minimum.

Firing Technique

- **BACKFIRE:** This stand will receive some stress shortly after the burn due to a scheduled thinning operation. A backing fire would keep stress from the burn to a minimum.
- **GRID IGNITION:** This is another option if fuel and/or weather conditions dictate. The interval between ignition points should be at least two chains to minimize scorch from conflagrations where spots burn together. A grid ignition fire should be converted to a backing fire if it starts burning too hot.

Burn Prescription for Stand 3.15

This sixty three acre stand consists of twenty-year-old planted pine (*Pinus elliotti*). It was last burned in the winter of 1992. There are no wetlands here. It is located adjacent to a range complex, and is subject to frequent wildfires caused by artillery rounds.

Goal — It is imperative to keep ground fuel at the lowest possible level which will, in turn, lessen possible damage to the timber caused by wildfires. The goal is to maintain the stand in this manner indefinitely with annual to semi-annual burns, depending on how soon there is sufficient fuel to carry another fire.

Prescribed Burn Parameters

- Wind Speed — 1-3 M.P.H.
- Time of Day — Morning, or as soon as it will burn.
- Season of Burn — Spring.
- Wind Direction — Any direction.
- Fuel Moisture — 10% or greater, preferably around 15%.
- Relative Humidity — Above 30%.
- Temperature — Below 90° F.

Boundaries and Crossbreaks — This stand is surrounded on all sides with firebreaks. There is one E/W crossbreak that intersects it that needs to be harrowed at this time and left to heal over.

Precautions — Adequate soil moisture should be present at the time of ignition.

Firing Technique — If fire is initiated early in the day, beginning techniques could be strip-head fire. As fuel moisture lowers, this could be changed to grid ignition if fire becomes too intense.

| | | |
|--|--------------------------|----------|
| Estimated Labor — | ___ Mandays Preparation | |
| | ___ Mandays Execution | |
| TOTAL: | ___ Mandays at a cost of | \$\$\$ |
| Estimated Equipment Cost — | | \$\$\$ |
| TOTAL COST OF LABOR AND EQUIPMENT | | \$\$\$\$ |

Burn Prescription for Stands 2.14, 2.16, 2.18, 2.23, and 2.24

These stands, with the exception of stand 2.24, are natural pine with longleaf (*Pinus palustris*) being the major species. Stand 2.24 is a natural stand of live oak (*Quercus virginiana*) and post oak (*Q. stellata*) which will be omitted from the burns because fire is more detrimental than beneficial to these hardwoods. All stands were last burned during the winter of 1991/1992. These stands have several small, isolated ponds in which slash pine (*Pinus elliotii*) are scattered throughout and in adjacent areas. Both species of pine have a good balance of age classes. Ground fuel predominantly consists of several species of wiregrass and saw palmetto. There is also scattered post oak, sand post oak (*Q. stellata* var. *margaretta*), and bluejack oak (*Q. cinerea*). Most of these oaks are still of a size vulnerable to summer fire. Total acreage to be burned is 213 acres.

Goal — The major objective of this initial, aerial burn is to prepare the entire area (with the exception of stand 2.24) for a growing season burn regime. Stand 2.24 will be excluded from the fire by means of a 16' wide, flat break that will be established by a bulldozer with a standard blade, and "freshened" with a 13' wide agricultural harrow prior to the burn. This strip may then be planted with rye or other wildlife foods.

Prescribed Burn Parameters

- Wind Speed — 1-3 M.P.H., in stand.
- Time of Day — Morning, as soon as it will burn.
- Season of Burn — Winter.
- Wind Direction — East or West.
- Fuel Moisture — 18% or greater.
- Relative Humidity — Above 50% at time of ignition.
- Temperature — Below 50° F.

Boundaries/Interior Breaks — These stands have Road 27 for the northern and eastern boundaries, Road 26 for the northwest boundary, and a firebreak for the southern boundary. Individual stands are divided either by Road 26, Road 27, or firebreaks. Stand 2.16 has an old woods trail as its northern and eastern boundary.

Firing Technique — Aerial Ignition, using Delayed Aerial Ignition Device (DAID), with a 1 × 1 chain grid. Usually, several lines are laid and then observed and spacing is adjusted as needed using a greater distance (maximum grid 4 × 4 chains) between spots when desiring a cooler burn. As fuel dries out, expect to increase grid spacing.

Precautions — When establishing the perimeter breaks for stand 2.24, keep the break outside of the drip line of the oaks that are being cut out. Be certain that there is adequate soil moisture in the stands prior to burning because aerial ignition can cause considerable stress from heat scorch where spots come together. Prior to aerial ignition, light the downwind side of the boundary break for stand 2.24 and allow ample time for the fire to back away from the oaks in order to minimize crown scorch.

APPENDIX A-EXAMPLE PLAN

Burn Prescription for Stands 2.14, 2.16, 2.18, 2.23, and 2.24 (continued)

| | | |
|-----------------------------------|------------------------|------------|
| Estimated Labor — | — Mandays Preparation | |
| | — Mandays Execution | |
| TOTAL: | — Mandays at a cost of | \$\$\$ |
| Estimated Equipment Cost — | Tractor | \$\$\$ |
| | Helicopter (DAID) | \$\$\$\$ |
| | TOTAL: | \$\$\$\$ |
| TOTAL COST OF LABOR AND EQUIPMENT | | \$\$\$\$\$ |

Exhibit D

DEPARTMENT OF THE ARMY

Management Guidelines
for the
Red-Cockaded Woodpecker
on Army Installations

21 June 1994

Management Guidelines
for the Red-cockaded Woodpecker
on Army Installations

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I. General.

A. Purpose. The purpose of these guidelines is to provide standard RCW management guidance to Army installations for developing installation endangered species management plans (ESMPs) for the Red-cockaded Woodpecker (RCW). Installation RCW ESMPs will be prepared according to these guidelines and chapter 11, AR 420-74, Land, Forest, and Wildlife Management. These guidelines establish the baseline standards for Army installations in managing the RCW and its habitat. Installation RCW ESMPs will supplement these guidelines with detailed measures to meet installation-specific RCW conservation needs. The requirements in RCW ESMPs will apply to all activities on the installation.

B. Applicability. The guidelines are applicable to Army installations where the RCW is present and to installations with inactive clusters that the installation, in consultation with the U.S. Fish and Wildlife Service (FWS), continues to manage in an effort to promote reactivation.

C. Revision. These guidelines will be revised as necessary to be consistent with the latest RCW recovery plan and to incorporate the latest and best scientific data available.

D. Mission. The Army's goal is to train for assigned combat and other missions while concurrently developing and implementing methods to assist in the recovery and delisting of the RCW.

E. Existing Biological Opinions. Installations will continue to comply with the requirements of existing biological opinions until RCW ESMPs are prepared in accordance with these management guidelines and chapter 11, AR 420-74 and are approved through consultation with the FWS. RCW ESMPs should be drafted to incorporate the requirements of existing biological opinions, as modified to conform to these management guidelines through consultation with the FWS.

II. Consultation.

A. In preparing RCW ESMPs and taking action that may affect the RCW, installations will comply with the consultation requirements of section 7 of the Endangered Species Act (ESA); the implementing FWS regulations at 50 CFR part 402; and chapter 11, AR 420-74.

B. Early entry into informal consultation with the FWS is key to resolving potential problems and establishing the foundation to address issues in a proactive and positive manner. If, through informal consultation, the FWS concurs in writing that the RCW ESMP or other action is not likely to adversely

affect any endangered or threatened species, formal consultation is not required. Issue resolution through informal consultation is the preferred method of consultation.

C. In consulting with the FWS on RCW ESMPs and other actions that may affect the RCW, the opinions of the FWS will normally be consistent with these guidelines. In exceptional cases, however, FWS opinions may require installations to take measures inconsistent with these guidelines. After every effort has been made at the installation and MACOM levels to resolve inconsistencies, installations will report, through MACOM channels, to the Office of the Director of Environmental Programs (ODEP), Headquarters, Department of the Army, FWS opinions that are not consistent with these guidelines. ODEP will expeditiously review these reports and determine if HQDA-level action is necessary. If feasible, installations should delay implementation of measures recommended by the FWS that are inconsistent with these guidelines until after the ODEP review is completed.

III. Army Policies Applicable to RCW Management.

A. *Conservation.* Implementation of RCW ESMPs, prepared in accordance with these guidelines, will meet the Army's responsibility under the ESA to assist in conservation of the RCW. Conservation, as defined by the ESA, means the use of all methods and procedures which are necessary for endangered and threatened species survival and to bring such species to the point of recovery where measures provided by the ESA are no longer necessary.

B. *Mission Requirements.* Installation and tenant unit mission requirements do not justify violating the ESA. The keys to successfully balancing mission and conservation requirements are long-term planning and effective RCW management to prevent conflicts between these interests. In consultations with the FWS, installations will attempt to preserve the ability to maintain training readiness, while meeting ESA conservation requirements.

C. *Cooperation with U.S. Fish and Wildlife Service.* The Army will work closely and cooperatively with the FWS on RCW conservation. Installations should routinely engage in informal consultation with the FWS to ensure that proposed actions are consistent with the ESA requirements.

D. *Ecosystem Management.* Conservation of the RCW and other species is part of a broader goal to conserve biological diversity on Army lands consistent with the Army's mission. Biological diversity and the long-term survival of individual species, such as the RCW, ultimately depend upon the health of the sustaining ecosystem. Therefore, RCW ESMPs should promote

ecosystem integrity. Maintenance of ecosystem integrity and health also benefit the Army by preserving and restoring training lands for long-term use.

E. Staffing and Funding. Installation commanders are responsible for ensuring that adequate professional personnel and funds are provided for the conservation measures prescribed by these guidelines and RCW ESMPs. Commanders are responsible for accurately identifying the funding needed to meet the requirements of these guidelines. RCW conservation projects are funded through environmental channels and will be identified in the Environmental, Pollution Prevention, Control and Abatement Report (RCS 1383).

F. Conservation on Adjacent Lands. Necessary habitat for the RCW includes nesting and foraging areas. Both of these RCW habitat components may be located entirely on installation lands. There may be instances, however, where one of these components is located on installation land, while the other is located on adjacent or near-by non-Army land. Installations should initiate cooperative management efforts with these landowners, if such efforts would compliment installation RCW conservation initiatives.

G. Regional Conservation. The interests of the Army and the RCW are best served by encouraging conservation measures in areas off the installation. Installations should participate in promoting cooperative RCW conservation plans, solutions, and efforts with other federal, state, and private landowners in the surrounding area.

H. Management Strategy. These guidelines require installations to adopt a long-term approach to RCW management consistent with the military mission and the Endangered Species Act. First, installations are required to establish an installation RCW population goal in consultation with the FWS using the methodology described in para V.B below. Once established, the installation must designate sufficient nesting and foraging habitat to attain and sustain the goal. The goal will also dictate the required management intensity level. Next, installations must develop an ESMP to attain and sustain the installation RCW population goal in perpetuity in accordance with chapter 11, AR 420-74. Third, installations are required to ensure that all units and personnel that conduct training and other activities at the installation comply with the requirements of the installation RCW ESMP.

IV. Definitions.

Augmentation - Relocation of an RCW, normally a juvenile/fledgling female, from one active cluster to another active cluster.

Basal area (BA) - The cross-sectional area (square feet) of trees per acre measured at approximately four and one-half feet from the ground.

Biological diversity - The variety of life and its processes. It includes the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur.

Buffer zone - The zone extending outward 200 feet from the outermost cavity trees in a cluster.

Cavity - An excavation in a tree made, or artificially created, for roosting and nesting by RCWs.

Cavity restrictor - A metal plate that is placed around an RCW cavity to prevent access by larger species. A restrictor also prevents a cavity from being enlarged, or if already enlarged, shrinks the cavity entrance diameter to a size that prevents access by larger competing species.

Cavity start - An incomplete cavity excavated by, or artificially created for, RCWs.

Cavity tree - A tree containing one or more active or inactive RCW cavities or cavity starts.

Cluster - The aggregate area encompassing cavity trees occupied or formerly occupied by an RCW group plus a 200 foot buffer zone (formerly called "colony").

Effective breeding pairs - Groups that successfully fledge young.

Group - A social unit of one or more RCWs that inhabits a cluster (formerly called "clan"). A group may include a solitary, territorial male; a mated pair; or a pair with helpers (offspring from previous years).

Habitat Management Unit (HMU) - Designated area(s) managed for RCW nesting and foraging, including clusters and areas determined to be appropriate for recruitment and replacement stands.

Impact/danger areas - The ground within the training complex used to contain fired or launched ammunition or explosives and the resulting fragments, debris, and components from various weapons systems.

Population - A RCW population is the aggregate of groups which are close enough together so that the dispersal of individuals maintains genetic diversity and all the groups are

capable of genetic interchange. Population delineations should be made irrespective of land ownership.

Provisioning - The artificial construction of cavities or cavity starts.

Recovery population - A total of 250 or more effective breeding pairs annually, for a five year period.

Recruitment - The designation and management of habitat for the purpose of attracting a new breeding group to that habitat.

Recruitment stand - A stand of trees, minimum of 10 acres in size, with sufficient suitable RCW nesting habitat identified to support a new RCW group. Stand and supporting foraging area should be located $3/8$ mile to $3/4$ mile from a cluster or other recruitment stand.

Relict tree - a pine tree usually more than 100 years old having characteristics making it attractive to the RCW for cavity excavation.

Replacement stand - a stand of trees, minimum of 10 acres in size, identified to provide suitable nesting habitat for colonization when the current cluster becomes unsuitable. The stand should be approximately 20 - 30 years younger than the active cluster. While it is preferable for replacement stands to be contiguous to the active colony, at no time should they be more than $1/4$ mile from the cluster, unless there is no suitable alternative.

Stand - an aggregation of trees occupying a specific area and sufficiently uniform in species composition, age, arrangement, and condition so as to be distinguishable from the forest on adjoining areas.

Sub-population - the aggregate of groups which are close enough together to allow for demographic interchange between groups. A sub-population does not have a significant demographic influence on adjacent sub-populations, but there is sufficient genetic interchange between the sub-populations to be considered one population.

Translocation - the relocation of one or more RCWs from an active cluster to an inactive cluster or recruitment stand that contains artificially constructed cavities.

V. Guidelines for Installation RCW ESMPs.

Installations will prepare RCW ESMPs and manage RCW populations according to the following guidelines.

A. RCW ESMP Development Process.

Preparation of installation RCW ESMPs requires a systematic, step-by-step approach. RCW populations (current and goal), RCW habitat (current and potential), and training and other mission requirements (present and future) must be identified. Detailed analysis of these factors and their interrelated impacts are required as a first step in the development of an ESMP. Installations should use the following or a similar methodology in conducting this analysis:

1. Identify the current RCW population and its distribution on the installation.
2. Identify areas on the installation suitable or potentially suitable for RCW nesting and foraging habitat.
3. Establish the installation RCW population goal with the FWS according to the guidance in B below. The installation RCW population goal will at least equal the current population.
4. Identify installation and tenant unit mission requirements. Overlay these requirements on the RCW distribution scheme.
5. Identify mission requirements that are incompatible with the conservation of RCW habitat.
6. Identify areas where conflicting mission requirements could be relocated to avoid RCW habitat.
7. Identify critical mission areas where activities cannot be relocated.
8. In consultation with the FWS, identify areas that will be subject to the expanded training guidelines in paragraph V.I.2.c below.
9. Identify areas which could support RCW augmentation or translocation.
10. Identify areas suitable for RCW habitat and free of conflicting present and projected mission activities. These are prime areas for designation as recruitment stands.
11. Analyze the information developed above using the guidance contained in these guidelines.
12. Prepare the RCW ESMP to implement the best combination of options, consistent with meeting the established RCW population goal, while minimizing adverse impacts to training readiness and other mission requirements.

B. RCW Population Goal.

1. One of the first steps in RCW management is to determine an installation population goal in accordance with paragraph V.B.2 below. Once this goal is established, it is used to designate the amount of land needed for RCW HMUs and the appropriate level of management intensity.

2. ESMPs must clearly state the installation RCW population goal. This goal will be established through informal or formal consultation with FWS. Goals should be carefully calculated considering the current and future installation and tenant unit missions, the amount and distribution of current and future suitable habitat on and off the installation, the quality of the habitat, the current size of the RCW population, the distribution of clusters, the configuration of sub-populations, the land ownership patterns, the recovery potential (see 3 below), the RCW Recovery Plan objectives, etc. The goal should strike a reasonable balance between the present and future installation and tenant unit missions and conservation. Once established, the population goal will determine the amount of installation land to be managed as RCW habitat. Goals should be considered long-term but are subject to change, through consultation with the FWS, based upon changing circumstances and new scientific information

3. The population goal established for an installation will dictate the required RCW management intensity level. A population that has achieved the installation goal need only be maintained at that level, however, installations should continue to encourage population growth where feasible and compatible with the military mission. In contrast, any population that has not achieved its population goal requires an active recruitment/augmentation strategy. A maintenance strategy is appropriate for populations which have attained the maximum population that can be supported by available suitable habitat, irrespective of population size. However, maintenance activities will vary according to the population size, for example, smaller nonviable populations may require occasional augmentation, predator control, etc.

C. Surveys, Inspections, and Monitoring Programs.

1. Installations will conduct the following surveys and monitoring programs.

a. Five-Year installation-wide RCW surveys. Effective management of the RCW requires an accurate survey of installation land for RCW cavity and cavity-start trees. The survey must document the location of RCW cavity and cavity-start trees as accurately and precisely as possible (using Global Positioning System and Geographic Information System, if

available) and the activity within all clusters. An installation-wide survey will be conducted every five years. Installations may conduct the survey over the five-year period, annually surveying one-fifth of the installation.

b. Project surveys. Prior to any timber harvesting operations, construction, or other significant land-disturbing activities, excluding burning, a 100-percent survey of the affected area will be conducted by natural resources personnel trained and experienced in RCW survey techniques and supervised by a RCW biologist, if one has not occurred within the preceding year. Installations will conduct project surveys in accordance with the survey guidance in V. Henry, Guidelines for Preparation of Biological Assessments and Evaluations for the Red-cockaded Woodpecker, U.S. Fish and Wildlife Service, Southeast Region, Atlanta, Georgia (September 1989). In the case of range construction, the survey will also include the surface danger zone for the weapons to be used on that range.

c. Annual inspections. Clusters that have not been deleted from management in accordance with paragraph V.D.2.b below and recruitment stands must be inspected annually. These are prescriptive inspections, used to develop treatments and modifications of treatments to maintain suitable nesting habitat. At a minimum, installations will inspect and record data for:

- (1) density and height of hardwood encroachment;
- (2) height of RCW cavities;
- (3) condition of cavity trees and cavities;
- (4) a description of damage from training, fires (prescribed or wild), etc.; and
- (5) evidence of RCW activity for each cavity tree (includes each cavity in the tree) within the cluster. See 2a below for guidance on the maintenance of survey and monitoring records.

d. Ten-year forest survey. In addition to an RCW survey required in 1a above, installations will conduct, as required by AR 420-74, an installation-wide forest survey at least every ten years. In conducting the forest survey, data will be gathered to accurately determine the quantity and quality of available foraging and nesting habitat for the RCW. Alternately, installations may survey ten percent of the installation annually. Forest surveys will be conducted using a recognized plot sampling technique, such as the random line plot cruise, the random point sample cruise, or the line strip cruise method. Forest surveys in impact areas may be conducted using

scientifically accepted, aerial photography interpretation methods.

e. Monitoring. Installations will conduct monitoring programs to scientifically determine demographic trends within the population as a whole. Sample sizes will be determined by the number of clusters and their dispersion on the installation by habitat category (e.g., longleaf pine/scrub oak, pine flatwoods, pine mixed hardwoods) and by category of use (e.g., non-dud producing ranges, mounted and dismounted training areas, cantonment areas, bivouac areas, etc.). Sample sizes will be of sufficient size to have statistical validity and to ensure that population trends and important biological information can be determined for the entire installation. Installations with 25 clusters or less will monitor all sites. Installations with greater than 25 clusters will monitor sample sizes based on the following: 25 percent of the RCW clusters (active and inactive) located in each habitat and usage category on the installation, with a minimum of three RCW clusters per habitat type or a total of 25 clusters, whichever is greater. Monitoring activities will be done annually to acquire data to determine the number of adults and fledglings per site, sex of birds, number of breeding groups, and number of nests. Monitoring will include color banding of birds.

2. Results from surveys and monitoring will be recorded as follows:

a. Survey/monitoring records. Survey and monitoring results will be recorded and retained permanently allowing for trend analysis.

b. RCW map. Survey data will be used to generate installation RCW maps accurately depicting the location of RCW clusters, HMUs, etc. The map will be widely distributed for use by those conducting land use activities on the installation, including military training, construction projects, range maintenance, etc. Maps will be updated at least every five years to coincide with the installation-wide RCW survey or when a 20 percent change in the number of clusters occurs, whichever is sooner.

D. RCW Habitat Management Units.

1. Designation of habitat management units (HMUs). Installation RCW ESMPs will provide for the designation of nesting and foraging areas within HMUs sufficient to attain and sustain the installation RCW population goal. Determination of the installation population goal is a prerequisite to HMU designation. HMU delineation is an important step in the planning process because it defines the future geographic configuration of the installation RCW population. Areas

designated as HMUs must be managed according to these guidelines.

2. Areas included within HMUs.

a. HMUs will encompass all clusters, areas designated for recruitment and replacement, and adequate foraging areas as specified in d below.

b. After consultation with the FWS, clusters that have been documented as continuously inactive for a period of five consecutive years or more may be deleted from HMUs. Once deletion of a cluster from management is approved by the FWS, existing cavities may be covered to discourage reactivation. This will be part of a long-term plan to shift the RCW population to areas on the installation where conflicts between RCW management and critical mission requirements will be minimized. Inactive clusters will not be deleted from HMU management unless sufficient clusters and recruitment stands exist on the installation, provisioned in accordance with these guidelines, to support the installation's RCW population goal (See 1 above).

c. In designating HMUs, fragmentation of nesting habitat will be avoided. Installations will attempt to link HMUs with HMU corridors, allowing for demographic interchange throughout the installation population.

d. Adequate foraging habitat, in size, quality, and location, must be provided within HMUs. The foraging habitat needed to support clusters will be calculated and designated according to the range-wide guidelines in V. Henry, Guidelines for Preparation of Biological Assessments and Evaluations for the Red-cockaded Woodpecker, U.S. Fish and Wildlife Service, Southeast Region, Atlanta, Georgia (September 1989) or other physiographic-specific guidelines approved by the FWS. The objective is to provide high quality habitat as close as possible to the cluster, rather than large areas of poor habitat.

3. Minimization of RCW management impacts on the installation's mission.

a. To the extent consistent with RCW biological needs, HMUs should be located where there will be a minimum impact upon current and planned installation missions/operations and should be consistent with land usage requirements in the Real Property Master Plan. This is particularly important regarding HMUs designated for recruitment/replacement purposes.

b. On installations where the RCW is present in areas where there are or potentially could be significant impacts on installation missions/operations, especially training-related operations, the RCW ESMP should provide for the following:

(1) The installation should designate additional HMUs beyond those needed to attain and sustain the installation population goal. Installations should manage these additional HMUs to promote population growth in these areas.

(2) To the extent that RCW biological and demographic needs allow, installations should locate these additional HMUs where RCW management requirements will not have a significant impact on mission/operations. This will allow for a gradual, long-term shifting of RCW sub-populations into more suitable areas through natural demographic shifting, recruitment, and, in exceptional cases, augmentation and translocation (described in paragraph V.J below). In accordance with 2 above, the movement of RCWs away from high mission-conflict areas can be further encouraged by the deletion of documented, inactive clusters from RCW management, while at the same time providing quality recruitment/replacement sites in areas with reduced mission conflicts.

4. Demographic and genetic interchange. Installations should delineate HMUs to maximize the linkage between sub-populations on and off the installations and with populations off the installation. Where fragmentation exists, installations should develop plans to link sub-populations on the installation by designating habitat corridors where practical.

E. *HMU Management Practices.* All HMU management activities and practices will be consistent with the conservation of other candidate and federally listed species.

1. Clusters and recruitment stands within HMUs.

a. Due to RCW biological needs, clusters require a higher management intensity level than other areas within HMUs. Within HMUs, maintenance priority will be given to active clusters over both inactive clusters and recruitment stands.

b. Clusters and recruitment stands will be kept clear of dense midstory. An open, park-like pine stand is optimal. All midstory within 50 feet of cavity trees will be eliminated. Beyond 50 feet, some pine midstory should be retained for regeneration and some selected hardwoods may be retained for foraging by species other than the RCW. Hardwoods should not exceed 10 percent of the area of the canopy cover nor 10 percent of the below canopy cover within the cluster or recruitment stand. Hardwood stocking should be kept below 10 square feet per acre.

c. The priority of forest management in cluster sites and recruitment stands is maintenance and production of potential cavity trees greater than 100 years of age. For this reason, no rotation age shall be set in these areas. In thinning

clusters and recruitment stands, dead, dying, or inactive cavity trees will be left for use by competitor species. Thinning should occur only when pine species basal area (BA) exceeds 80 and should not exceed the removal of more than 30 BA to avoid habitat disruption (timber prescriptions within clusters should normally be on a 10 year cycle). Pine species basal areas should be kept within the range of approximately 50 to 80 square feet, maintaining average spacing of 20 to 25 feet between trees, but retaining clumps of trees.

d. Trees within HMUs affected by beetle (e.g., Ips beetle, southern pine beetle) infestation should be evaluated for treatment and treated appropriately. Treatment options will be developed in consultation with the FWS. Possible treatments include the use of pheromones or cutting and leaving, cutting and removing, or cutting and burning infected trees. Cavity trees may be cut only with the approval of the FWS. Prior to cutting an infected cavity tree, a suitable replacement cavity tree will be identified and provisioned.

e. Timber cutting, pine straw harvesting, and habitat maintenance activities, with the exception of burning activities, will not be conducted during the nesting season, occurring from April through July depending upon the installation's location. If a biologist, experienced in RCW management practices, determines that habitat maintenance activities, exclusive of timber cutting and pine straw harvesting, will have no effect on nesting activities, they may be conducted at anytime.

2. Other areas within HMUs. While not requiring the same level of intense management for clusters and recruitment stands, the quality of foraging and replacement stands should be maintained by a prescribed burning program sufficient to control hardwood growth and ground fuel buildup and to eliminate dense midstory. Improving the quality of foraging habitat will reduce the quantity (acreage) required to maintain the installation RCW population.

3. Midstory control. Prescribed burning is normally the most effective means of midstory control and is recommended as the best means of maintaining a healthy ecosystem. Prescribed burning will be conducted at least every three years in longleaf, loblolly, slash pine, and shortleaf pine systems. Burning must be conducted in accordance with applicable Federal, state, and local air quality laws and regulations. With the agreement of the FWS, the burn interval may be increased to no more than five years after the hardwood midstory has been brought under control. Mechanical and chemical alternatives should only be used when burning is not feasible or is insufficient to control a well advanced hardwood midstory. Application of herbicide must be consistent with applicable Federal, state, and local laws and

regulations. Cavity trees will be protected from fire damage during burning. Burning should normally be conducted in the growing season since the full benefits of fire are not achieved from non-growing season burns. Winter burns may be appropriate to reduce high fuel loads. Use of fire plows in clusters will be used only in emergency situations.

4. Erosion control. Installations will control excessive erosion and sedimentation in all HMUs. Erosion control measures within clusters will be given priority over other areas within HMUs.

5. Impact/danger and direct fire areas.

a. Impact/danger areas.

(1) Impact/danger areas that contain or likely contain unexploded ordnance or other immediate hazardous materials (radiological or toxic chemicals) can pose danger to personnel. Natural resources conservation benefits to be gained by intensive management in high risk areas generally are not justified.

(2) Designation of impact/danger areas, safety restrictions on human access to impact/danger areas, range operations in impact/danger areas, and the associated effects of these actions on RCW management activities may adversely affect the RCW and other federally listed species within impact/danger areas, including the possibility of incidental take. Installations are responsible for consulting with the FWS on these potential effects.

(3) To the degree practicable, clusters and surrounding foraging area should be designated as "no fire areas" to protect clusters from projectile damage.

b. Direct fire areas.

(1) Direct fire, non-dud producing impact areas that do not contain unexploded ordnance or other immediate hazardous materials may be included within HMUs, subject to the guidelines set forth below.

(2) In HMUs which are not impacted upon by weapons firing, RCW management will be the same as for HMUs outside of impact areas. In HMUs where there is a significant risk of projectile damage to foraging or nesting habitat, the following guidelines apply:

(a) Range layout will be modified/shielded to protect HMUs from projectile damage, if practicable. Protective measures that will be considered include

reorienting the direction of weapons fire, shifting target arrays, establishing "no fire areas" around RCW clusters or HMUs, revising maneuver lanes, constructing berms, etc.

(b) Installations should develop alternate HMUs near existing HMUs but outside the affected range complex. Augmentation and translocation should be considered as a means of removing RCWs from high risk areas.

F. Timber Harvesting and Management in HMUs.

1. Timber harvesting in HMUs will be permitted if consistent with the conservation of the RCW. If permitted, a harvest method will be implemented that maintains or regenerates the historical pine ecosystem. In most ecosystems inhabited by the RCW, historical conditions are characterized by old-growth longleaf pines in an uneven-age forest, with small (1/4 to 5 acres) even-age patches varying in size. Timber harvesting methods must be carefully designed to achieve and maintain historical conditions through emulation of natural processes.

2. Longleaf sites will not be regenerated to other pine species. Where other species have either replaced longleaf pine (due to fire suppression) or been artificially established on sites historically forested with longleaf, forest management will be directed toward regeneration back to longleaf by natural or artificial methods.

3. At a minimum, sufficient old-growth pine stands will be maintained by: lengthening rotations to 120 years for longleaf pine and 100 years for other species of pine; indefinitely retaining snags, six to ten relict and/or residual trees per acre when doing a clearcut, seedtree cut, or shelterwood cut; and indefinitely retaining snags, all relicts, and residuals in thinning cuts. No rotation age will be established for cluster sites or replacement stands. The above rotation ages and retention rates do not apply to off-site stands of sand pine, loblolly pine, or slash pine that will be converted back to longleaf.

G. *Pine Straw Harvesting within HMUs.* Sufficient pine straw must be left in HMUs to allow for effective burning and to maintain soils and herbaceous vegetation. Areas within HMUs will not be raked more than once every three to six years. Baling machinery will not be used or parked within clusters.

H. Restoration and Construction of Cavities.

1. Restoration. Active and inactive cavities found to be in poor condition during periodic inspections will be repaired whenever feasible to prolong their use. Cavity restrictors can be installed on enlarged RCW cavity entrance holes (greater than

two inches in diameter) to optimize the availability of suitable cavities. They also may be installed to protect properly-sized cavities where suitable cavities are limited, the threat of enlargement is great, or where another species is occupying a cavity. Priorities for the installation of restrictors, in descending order, will be: (a) active single tree clusters, (b) single bird groups, (c) clusters with less than four suitable cavities, and (d) others. Restrictors will be installed according to scientific procedures accepted by the FWS. Restrictors will be closely monitored, especially in active clusters. Adjustments to the positioning of the restrictors will be made to ensure competitors are excluded and RCW access is unimpeded.

2. Construction. Artificial cavities will be constructed in areas designated for recruitment or translocation and in active clusters where the number of suitable cavities is limiting. The objective is to provide at least four suitable cavities per active cluster and two cavities plus three advanced starts for each recruitment stand. Priorities for installation of artificial cavities in descending order will be: (a) single cavity tree active clusters, (b) active clusters with insufficient cavities to support a breeding group, (c) inactive clusters designated as and managed for replacement or recruitment stands with an insufficient number of usable cavities within one mile of an active cluster, (d) new replacement/recruitment stands within one mile of an active cluster, (e) inactive clusters designated as and managed for replacement or recruitment stands within three miles of an active cluster, (f) recruitment or potential habitat within three miles of an active cluster, (g) inactive clusters and (h) replacement/recruitment stands beyond three miles of an active cluster. Cavity construction may be by either the drilling or insert techniques. Construction must be according to scientific procedures accepted by the FWS and accomplished by fully trained personnel.

I. *Protection of Clusters.*

1. Markings. The following uniform marking guidance for RCW clusters will supersede the marking guidance issued by the Directorate of Environmental Programs, dated 8 Jan 1993.

a. Cavity and cavity-start trees. These trees will be marked with two white bands, approximately four to six inches wide and one foot apart. The bands will be centered approximately four to six feet from the base of the tree. A uniquely numbered small metal tag will be affixed to the cavity tree for monitoring and identification purposes.

b. Clusters. Buffer trees on the outer perimeter of clusters will be marked with a one to two foot-wide white band four to six feet from the base of the tree. Warning signs (c

below) will be posted at reasonable intervals facing to the outside of clusters and along roads, trails, firebreaks, and other likely entry points into clusters.

c. Warning sign. Signs posted at clusters will be constructed of durable material, ten inches square (oriented as a diamond), white or yellow in color, and of the design in Figure 1. The RCW graphic and the lettering "Endangered Species Site" and "Red-cockaded Woodpecker" will be printed in black. The lettering "Do Not Disturb" and "Restricted Activity" will be printed in red. All lettering will be 3/8 inches in height.

d. Installations will conform to the uniform markings guidelines in a through c above by 1 Jan 1997. Signs erected and markings made after the effective date of these guidelines will conform to the standards in a through c above.

e. Training on non-Army lands. Installations conducting long-term training on private, state, or other federal lands with RCW habitat will attempt to obtain agreement from the landowners on compliance with these markings guidelines. If a landowner does not agree to compliance with these guidelines, even with the installation paying the costs associated with compliance, installations will educate troops training on such lands to recognize the markings used by the landowner.

2. Training within RCW clusters.

a. The training guidelines in this section apply within clusters, as defined in paragraph IV above. RCW-related training restrictions do not apply to recruitment and replacement stands and foraging areas.

b. Standard training guidelines within clusters.

(1) Military training is limited to dismounted training of a transient nature.

(2) No bivouacs.

(3) No digging or cutting of vegetation, except for hardwoods used as camouflage.

(4) Use of CS gas, smoke, flares, incendiary devices, artillery, artillery simulators, mortars, or similar devices is prohibited within clusters. Elsewhere on the installation, units will coordinate with both the installation natural resources office and range control prior to using CS gas and smoke, other than smoke grenades. Use of blanks in M16 rifles and handguns is permitted.

(5) Vehicle travel through clusters is limited to designated and maintained roads, trails, and firebreaks identified on official installation maps used for this purpose. Installations must consult with FWS prior to the establishment of new trails, roads, or firebreaks in or through RCW clusters.

(6) With FWS approval through informal consultation, off-road through-traffic by wheeled vehicles, 5 tons or less, travelling at least 100 feet away from cavity trees may be permitted on an infrequent basis for specific exercises. The effects of this off-road vehicular traffic will be monitored and documented to determine long-term trends.

c. Expanded training guidelines within clusters.

(1) In consultation with the FWS, the installation may designate clusters, not to exceed 10 percent of the RCW clusters on the installation, that will be subject to expanded training guidelines. In these designated clusters, the standard training guidelines in 2b above apply, except that the following additional activities, with stated restrictions, are allowed:

(a) Bivouacs and battalion-level and below command posts are allowed, providing they remain at least 200 feet away from cavity trees. Digging is prohibited. These fixed activities will be limited in duration to 18 consecutive hours or less from 1 August through 31 March and to 6 consecutive hours or less from 1 April through 31 July.

(b) Use of blanks in individual and crew-served (M60 MG and below) weapons is permitted.

(c) Wheeled vehicles are permitted to travel and remain in clusters so long as soil erosion levels remain within tolerance limits for that soil series under Soil Conservation Service standards. Vehicles will remain at least 200 feet from all cavity trees at all times except as allowed under the standard training guidelines in 2b(5) above.

(2) Installations will implement a monitoring plan, approved by the FWS, to record the effects of the expanded training activities and to identify any potential adverse impacts on the RCW. In the event potential adverse impacts are identified, the installation will suspend the expanded training guidelines and implement the standard training guidelines in 2b(5) above and will consult the FWS.

d. Training guidelines will be actively enforced through installation training and natural resources enforcement programs, prescribed in chapters 1 and 11, AR 420-74, and installation range regulations.

J. *Augmentation and Translocation.*

1. Augmentation can be a useful tool to expand and disperse the RCW population into designated HMUs. Augmentation also provides a means to maintain genetic viability in populations with less than 250 effective breeding pairs. Installation plans will provide for the augmentation of single-bird groups. Clusters will be made suitable in accordance with the requirements/procedures outlined in paragraph V.H. above before augmentation is attempted.

2. In exceptional situations, installations may translocate RCWs from active clusters to inactive clusters or recruitment/replacement stands where cavities have been artificially constructed. For example, translocation could be used to move RCWs from live fire areas where there is a significant risk of harm to the birds. The current scientific literature indicates serious limitations in successfully translocating adult RCWs, in particular, adult territorial males. Translocation will be accompanied by an intensive monitoring program.

3. In areas to receive RCW, habitat designation and improvement work ensuring that nesting and foraging habitat meet the standards established by these guidelines (V.E.1.b and c, V.E.2, V.D.2.d) must be completed before augmentation or translocation is attempted.

4. Neither augmentation nor translocation will be undertaken without the approval of and close coordination with the FWS. Installations must obtain an ESA section 10 permit (scientific purposes) or an incidental take statement under ESA section 7 and all applicable marking, banding, and handling permits prior to moving any RCW through augmentation or translocation.

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